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Job Embeddedess of Nurses Working in South Central Appalachia's North Carolina Counties

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by

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ABSTRACT

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Nurses working in the North Carolina counties of South Central Appalachia (NC-SCA) are a unique subset of nursing professionals. A continued nursing shortage is projected in this area while staffing has improved in other areas of SCA. The purpose of this research was to ascertain the level of job embeddedness of nurses working in NC-SCA in order to offer guidance regarding retention of nurses working in this area. Actively working licensed practical nurses, registered nurses, and advanced practice nurses (nurse practitioners, certified nurse midwives, clinical nurse specialists, and certified registered nurse anesthetists) from 29 North Carolina counties included in South Central Appalachia comprise the study population. Rural Nursing Theory alongside the concept and theory of Job Embeddedness (JE) examines organizational and community influences on retention. Data collection consisted of an online survey and included a demographic questionnaire along with the JE research instrument. Understanding what keeps these nurses on the job is beneficial to nurses, health care organizations, and patients. History of living in rural area, years at job position, intent to stay, work commute in miles, and work commute drive time were significant factors in Job Embeddedess prediction.

DEDICATION

I would like to thank those without whose help I would have never reached this stage in my education. Dr. Florence Weierbach has been my mentor, advisor, and cheerleader and helped me push through the difficult times. Dr. Angeline Bushy, Dr. Wendy Nehring, and Dr. Patricia Van Hook provided invaluable insight, guidance, and encouragement to this project. The faculty of the East Tennessee State University College of Nursing provided a rich educational experience that will serve me well for the rest of my career. I would also like to thank my family and friends for supporting me as I completed this program. Finally, I would like to thank the nurses of South Central Appalachia's North Carolina counties who took the time to participate in this study – I am forever grateful!

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CHAPTER 1

INTRODUCTION

Nurses working in South Central Appalachia are a unique subset of nursing professionals. Residents of these areas tend to define health as the ability to work instead of the absence of disease. This worldview requires patience and flexibility on the part of nurses. Nurses from rural areas also face unique challenges as, for better or worse, they face high standards as providers of confidential, comprehensive health care in a very transparent environment (Long & Weinert, 2013). Nurses comprise the largest percentage of health care providers in rural areas but retention of these nurses remains less well studied compared to other health professionals (Daniels, VanLeit, Skipper, Sanders, & Rhyne, 2007). Understanding the rural nurse, rural nurse turnover, rural nurse retention, and rural nurse level of job embeddedness the heavily rural North Carolina counties of South Central Appalachia has potential to improve future nurse retention in this area.

South Central Appalachia

Nursing has a long history in South Central Appalachia and Appalachia in general with several notable individuals having made a lasting impact on health care in this area and beyond. Martha Rogers, a nursing theorist best known for her theory of "Science of Unitary Human Beings" graduated from Knoxville General Hospital School of Nursing in 1936 (Currentnursing.com, 2012). Jean Watson was born in West Virginia and attended nursing school in Roanoke, Virginia. She is best known for her nursing theory of caring (McEwen & Wills, 2011). Mary Breckenridge, founder of Frontier Nursing Service, worked to improve prenatal care in Leslie County, Kentucky through the use of midwives and provided a model of how nursing care can improve health in rural areas (Frontier Nursing University, 2016).

South Central Appalachia covers about 35,000 square miles (Pollard & Jacobsen, 2016). Figure 1 displays a map of Appalachia (Appalachian Regional Commission, 2008). The SCA area had a population of around 4.7 million people according to 2010 census data (Pollard and Jacobsen, 2016). The 29 Appalachian counties located in North Carolina had a population of around 1.6 million in 2009 (Appalachian Regional Commission, 2009).

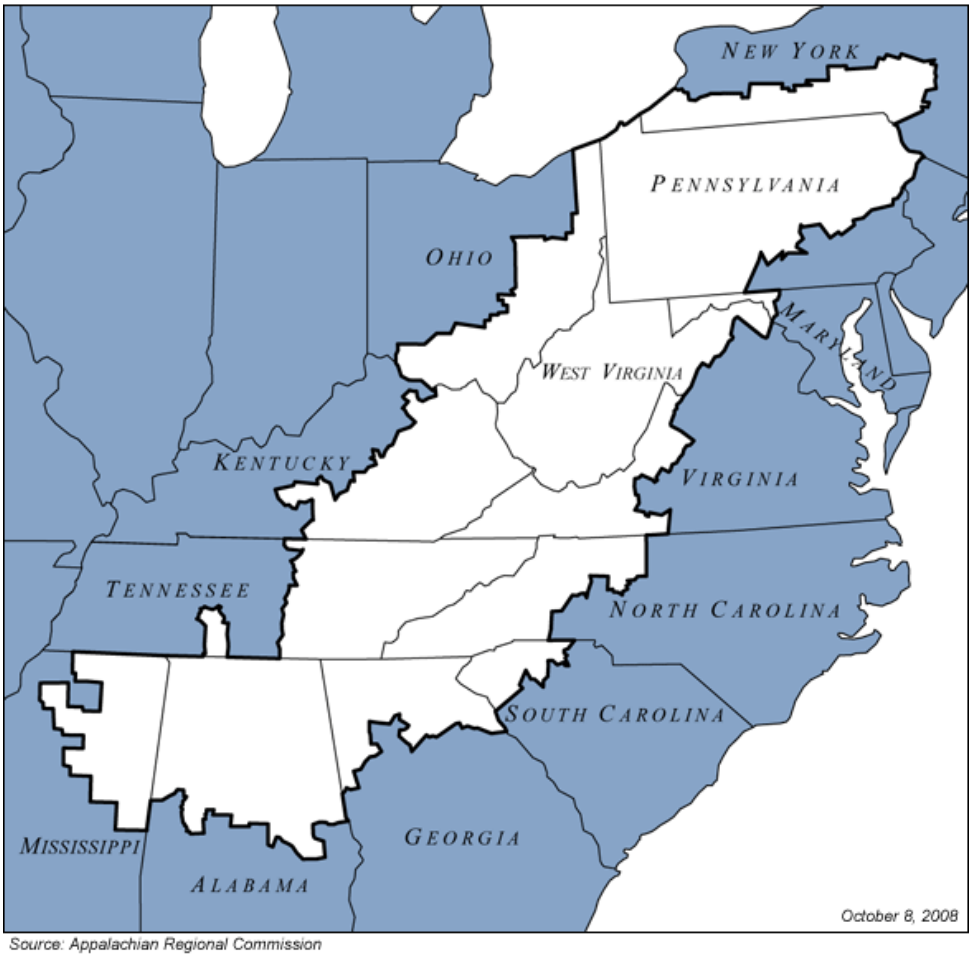

Figure 1. Map of Appalachia (no permission needed for use-image reduced in size) (Appalachian Regional Commission, 2008).

The health of the Appalachian region was improving 40 years ago but now mortality rates are rising despite improvements in the remainder of the United States. This rate increase is aggravated by rising obesity rates, increased incidence of diabetes, and a large elderly

population. In 2010, the national mortality rate was 800 deaths per 100,000 people and the Appalachian mortality rate was 1,108 deaths per 100,000 people. This is compared to mortality rates from 1968 in which the national mortality rate was 967 per 100,000 and the Appalachian rate was 1083 per 100,000 (Center for Regional Economic Competitiveness and West Virginia University, 2015).

Many factors influence the health of a region. Although more residents have health insurance in SCA now, lack of access to health care still exists. The NC-SCA counties rank among the lowest in Appalachia according to the Health Care Cost, Coverage, and Access (HCCA) Index proposed by the Appalachian Regional Commission (2011). Health care cost is determined from the CMS Hospital Wage Index Rescaled. Health care coverage is the percent of insured residents below age 64. Health care access is the number of providers per 100,000 people and hospital beds per 10,000 people in the area. This index demonstrates statistical significance in relation to health status. A low HCCA index is associated with higher preventable mortality rates. Persistent poverty is also predictor of poor health status in this region and SCA has the second highest poverty rate in Appalachia (Lane et al., 2012; Pollard & Jacobsen, 2016). Improving retention of nurses in this area could improve access to health care and potentially improve health outcomes (Fields, Bigbee, & Bell, 2016).

Although selected areas of the South Central Appalachia are projected to have a nursing surplus by 2025, North Carolina is projected to have a deficit of around 12,900 registered nurses (United States Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis, 2014). Rural areas are especially in need of nurses (Hoban, 2016).

Rural Nurses

Approximately one fifth of Americans live in medically underserved areas and many of these areas are rural (Molinari & Monserud, 2008). Previous studies have noted that students with prior experiences in rural areas are more likely to work in rural areas. This phenomenon was reinforced by a rural nurse job satisfaction study by Molinari and Monserud in 2008. Producing nurses interested in going back or going to rural settings historically has been a challenging endeavor. Rural nurses may feel a lack of incentive to pursue higher education as job opportunities are more plentiful for LPN or associate degree RN positions rather than baccalaureate or graduate degree nursing positions (Dotson, Dave, Cazier, & Spaulding, 2014). Providing graduate and undergraduate clinical experiences in rural settings provides rural health care system exposure to potential future employees (Hendrickx, Mennega, & Johansen, 2013).

Low pay, limited opportunities for career advancement, and rural community characteristics such as isolation have the potential to dampen enthusiasm to practice in rural areas (Murray, Havener, Davis, Jastremski, & Twichell, 2011). Dotson et al. (2014) noted in their study of rural nurse retention that stress levels and salaries were major factors influencing the decision to remain working in rural settings. Molinari and Monserud (2008) found that "off the job" issues such as family relationships, friendships, and adequate work for spouses influenced job satisfaction. Having supportive nursing leadership also influences rural nurse job satisfaction. Careful selection of these leaders is important as rural residents are hesitant to work with "outsiders." Drawing from the existing rural nurse workforce may be desired and ensuring adequate management training would be needed for a smooth transition (Lee & McDonagh, 2013).

Turnover

Voluntarily leaving one's place of employment is referred to as turnover. Turnover can be attributed to attrition or job dissatisfaction. The nursing workforce in the United States is aging and job vacancies due to retirement are expected to increase over the next decade. The country as a whole will need just over one million more nurses by 2022 (American Association of Colleges of Nursing, 2014). To make matters worse, the new graduate nurse turnover rate is around 30% by the end of the first year (Twibell & St. Pierre, 2012). Nursing turnover is expensive to health care organizations - costing up to a year's wages or more (Stroth, 2010). Nursing turnover increased about three and a half percent in the past five years according to a study conducted by Nursing Solutions, Incorporated (NSI) (2015). The time to replace a rural nurse can take up to sixty percent longer compared to urban nurses (Stroth, 2010).

Turnover also results in increased costs and lower levels of safety. Turnover can be associated with understaffing and understaffing is associated with poor patient outcomes. A study by Needleman et al. (2011) found that mortality increased significantly when patients were exposed to understaffed nursing unit shifts. Pediatric patients admitted to hospitals with inadequate staffing ratios were 11% more likely to be readmitted within two to four weeks (Tubbs-Cooley, Cimiotti, Silber, Sloane, & Aiken, 2013). Understaffing is also associated with increased job stress. Reducing stress and improving job satisfaction resulted in lower turnover regardless of setting (Dotson et al., 2014).

Retention

Retention of rural nurses not only involves keeping nurses working in rural areas but also keeping them in nursing altogether. Many rural nurses leave the profession due to burnout and dissatisfaction at work. Lack of other types of rural health care providers affects nurse retention

as well. For example, less than 10% of physicians work in rural areas. This puts greater pressure on nurses of all types to help "carry the load" as around 20% of Americans live in rural areas. "Value congruence" or feeling that the nurse is able to function in a way that reflects personal, moral, social and other values promotes retention in rural areas and makes up for deficiencies in pay or other benefits (Dotson, Dave, Cazier, & McLeod, 2013). Preceptor programs for newly graduated nurses were associated with higher retention (Salt, Cummings, & Profetto-McGrath, 2008). Efforts to provide financial incentives such as sign on bonuses or loan forgiveness in order to attract nurses to rural practice have had mixed results regarding retention improvement (Daniels et al, 2007). Native American nurses cited feelings of accomplishing one's mission in life accompanied by feeling respected by the community as factors associated with staying in rural tribal settings, for example (Katz, O'Neal, Strickland, & Doutrich, 2010). Health care organizations can increase retention by attending to research regarding this topic, however a recent study found that many health care organizations do not have comprehensive retention programs (Nursing Solutions Incorporated, 2015). Attending to these facets of retention would be beneficial to health care organizations interested in keeping or growing their nursing workforce.

Job Embeddedness

The concept of Job Embeddedness (JE) was introduced in 2001 in the business literature in order to describe characteristics associated with employees who stay on the job (Mitchell, Holtom, Lee, Sablyski, & Erez, 2001). Previous research examined retention, turnover, and job satisfaction but failed to fully describe characteristics of long serving employees (Stroth, 2010). Job Embeddedness explained almost 25% of the variance in a study of job retention in rural and urban Illinois nurses (Reitz, Anderson, & Hill, 2010). Responding to low level of embeddedness

has the potential to reduce turnover when levels of job embeddedness are surveyed regularly (Jiang, Lie, McCay, Lee, & Mitchell, 2012). A negative relationship exists between job embeddedness and turnover (Jiang et al, 2012).

There is no "one size fits all" definition of job embeddedness. Instead, job embeddedness is a "constellation" comprised of six factors - organizational fit, organizational links, organizational sacrifice, community fit, community links, and community sacrifice. Fit describes how well the nurse "fits in" the organization or community. Links denotes how many professional and community connections the nurse has made. Sacrifice represents how much would be lost (financially, social, emotionally, etc.) by leaving the community or organization (Mitchell et al., 2001). Job embeddedness can be also be affected by demographic factors such as age. Younger nurses were more likely to have lower levels of job embeddedness and were more likely to leave a nursing position due to lack of organizational fit in a population of nurses with one to three years of experience (Halfer, 2011). Organizations committed to cultivating job embeddedness reduced turnover by half when compared with the national average (Stroth, 2010). This information is inspiring and demonstrates the value of assessing job embeddedness in the nursing workforce.

Statement of the Problem

Workforce data regarding nurses (LPN, RN, and APRN - nurse practitioners, certified nurse midwives, clinical nurse specialists, and certified registered nurse anesthetists) working in the North Carolina counties of South Central Appalachia (NC-SCA) is present, but more is needed (Fraher & Jones, 2011). Research specifically addressing Job Embeddedness for this population are scant at best. Improving recruitment and retention of nurses to this area stands to improve health outcomes of residents (American Association of Colleges of Nursing, 2014).

Acquisition of more specific data related to characteristics of highly embedded nurses working in NC-SCA is important.

Purpose of the Study

The purpose of this research is to ascertain the level of job embeddedness of nurses working in NC-SCA in order to offer guidance regarding retention of nurses working in this area.

Specific Aims

1. What is the Job Embeddedness (JE) score of nurses in NC-SCA as measured by the Mitchell et al, (2001) *Job Embeddedness Scale*?

2. Is there a difference in JE scores between nurses working in rural areas versus nurses working in urban areas in NC-SCA?

3. What are the JE characteristics of highly embedded nurses working in NC-SCA?

4. Is intent to leave predictive of low levels of job embeddedness for nurses working in NC-SCA?

5. What factors predict job embeddedness scores for nurses working in NC-SCA?

Assumptions

1. There will be high total levels of embeddedness in nurses working in NC-SCA.
2. The JE score in nurses working in rural areas will be lower than that of urban nurses.
3. Community fit and community sacrifice embeddedness scores will be high in nurses working in NC-SCA with high total *Job Embeddedness Scale* scores.
4. Intent to leave will be predictive of low JE levels in nurses working in rural areas (those with a RUCA code 4-10.1 work address zip code).

5. Highly embedded nurses working in rural areas will have strong ties to the community or will have had rural educational experiences.

Research Design

A cross-sectional, descriptive design is an appropriate choice to address the questions for this study (Polit & Beck, 2012).

Research Variables and Definitions

Independent variables:

1. Location – work address zip code
2. type of nurse – LPN, RN, APRN
3. educational background – highest level of education
4. length of time at position – measured in years
5. history of residing in a rural area
6. history of receiving all or part of nursing education in a rural area
7. age – measured in years using birthdate
8. intent to stay – intends to stay in current position for the next year
9. intent to leave – intends to leave current position in the next year
10. Nurse residence zip code
11. Distance to work from home in miles
12. Time to work from home in minutes

Dependent variable:

1. Job embeddedness – the array of community and organizational "links, fit, and sacrifice" that predicts turnover and intent to leave one's position as determined by the Mitchell et al. (2001) *Job Embeddedness Scale*.

A text box for additional comments was included at the end of the survey.

Theoretical Framework

Job Embeddedness Theory (Mitchell et al., 2001) along with Rural Nursing Theory (Long & Weinert, 2013) comprise the theoretical underpinnings for this study. An aim of this study is to offer information to employers that may improve retention, discovering what keeps nurses in their current position is essential. Job Embeddedness Theory appeared in the business literature in 2001 as a method to predict voluntary turnover and employee intent to leave and conversely offer insight on intent to stay. Multiple concepts influence retention and this theory addresses community and organizational influences on the concepts of employee "fit" within these areas, employee "links" to the workplace and surrounding area, and the amount of "sacrifice" required to convince the employee to leave the workplace or area (Mitchell et al., 2001). For example, a feeling of not fitting in at work or in the community could influence the decision to move or change jobs. Having a connection or "link" with the workplace or the community may ease transitions to new jobs or towns. These same connections of "link" and "fit" can become strong enough that a person stays in a job they may not like because the "sacrifice" of leaving outweighs low job satisfactions. Therefore, an inverse relationship exists between job embeddedness and turnover. Higher levels of JE result in lower levels of turnover (Mitchell et al., 2001).

The authors of the Job Embeddedness Theory felt previous attempts to improve retention by measuring job satisfaction, intent to leave, and organizational commitment were lacking adequacy to account for variance in findings. This theory reflects influences of the "Unfolding Model of Turnover" which addressed job turnover in response to negative life events. Lewin's Field Theory and the notion that individuals are "embedded" in a "perceptual life space" that impedes movement out of their surroundings also influenced Job Embeddedness Theory (Reitz & Anderson, 2011). Determining factors associated with high JE can inform employers regarding areas to accentuate to enhance retention as well as areas to work on to reduce intent to leave.

Much of SCA is rural or mixed rural according to the Isserman typology (rural-less than 500 people per square mile, urban – at least 500 people per square mile, mixed rural less than 320 people per square mile, mixed urban – at least 320 people per square mile) (Isserman as cited in Feser, Mix, White, & Poole, 2014). Therefore, incorporating Rural Nursing Theory (Long & Weinert, 2013) is only fitting. Rural Nursing Theory supplies a framework to provide culturally appropriate health care to rural residents. This theory contains three major statements. The first acknowledges that rural residents often define "health" as the ability to work. The presence of an illness or condition is folded into everyday life as long as one can carry on with their responsibilities (Long & Weinert, 2013). The second statement notes that self-reliance is prominent in rural residents and resistance to care from "outsider" or government associated programs is evident. An associated statement reveals that initially at least, "informal" sources of health care are sought prior to engaging "formal" sources of health care (Long & Weinert, 2013, p. 7). The third statement addresses nurses working in rural areas themselves. The lack of

anonymity combined with a "generalist" role is a hallmark of rural nursing practice. This can be an asset or liability to individual scenarios (Long & Weinert, 2013).

Rural Nursing Theory complements Job Embeddedness Theory in that both recognize multifactorial influences on individuals. Connecting the rural definition of health – the ability to work – to the Job Embeddedness concept of organizational "sacrifice" reflects the hardship associated with leaving one's job due to illness. The Job Embeddedness concept of "fit" notes the importance of "fitting in" and how "outsiders" have problems gaining trust in rural areas. The dilemma the rural nurse faces with lack of anonymity demonstrates the role of community "links" as described by the Job Embeddedness Theory (Long & Weinert, 2013; Mitchell et al., 2001).

Conclusion

By understanding the influences of Job Embeddedness in South Central Appalachia region of North Carolina, health care organizations can form geographic-specific retention strategies. Assessing the level of JE has the potential to contribute to a more stable rural nursing workforce that could improve patient outcomes (Stroth, 2010).

CHAPTER 2
REVIEW OF LITERATURE

Information regarding retention of nurses working in rural areas in NC-SCA is lacking. Incorporating the concept and theory of Job Embeddedness in data collection will provide a detailed description of retention related characteristics of these nurses. A literature search employing Google Scholar, CINAHL, and PubMed resulted in a variety of sources to inform this research effort. Key words included job embeddedness, rural, nursing, South Central Appalachia, North Carolina, turnover, and retention. This chapter further explores characteristics of NC-SCA and rural nursing along with the concepts of retention, turnover, and Job Embeddedness. Overviews of Job Embeddedness Theory and Rural Nursing Theory are also provided.

North Carolina Counties in South Central Appalachia

The area known as South Central Appalachia consists of 85 counties located in East Tennessee, Western North Carolina, and Western counties of Virginia (Appalachian Regional Commission, 2016). The area is home to 4,759,012 people (Pollard & Jacobsen, 2016). Understanding the population within the South Central Appalachia region informs those seeking to initiate research efforts. There are 29 counties in North Carolina included in South Central Appalachia (Appalachian Regional Commission, 2016). Of these counties, 13 are "at risk", 12 are "transitional", and four are "distressed" economically (Appalachian Regional Commission, 2016). Using Rural Urban Commuting Code definitions, urban areas have the code 1-3 and rural areas have codes of 4-10. Eight counties in NC-SCA have urban zip codes, nine have a mix of rural and urban zip codes, and 12 have rural zip codes (United States Department of Agriculture

Economic Research Service, 2007; Washington, Wyoming, Alaska, Montana, & Idaho Rural Health Research Center, 2016).

Contextual information regarding a population assists researchers in planning studies (Bushy, 2008). Understanding the rural culture can improve the health of the area. As a solution to a shortage of health care providers, loan forgiveness and J-1 work waivers have brought in "outsiders" to fill open positions. This phenomenon highlights the need to respect cultural values and applies to others who wish to work in the area as culturally inappropriate care may lead to lack of adherence to treatment regimens, for example (Bushy, 2008; Molinari & Monserud, 2009;). Strong religious beliefs are associated with SCA residents. Often these beliefs include a fatalistic worldview (McGarvey, Leon-Verdin, Killios, Guterbock, & Cohn, 2011). A fatalistic worldview involves a feeling that God is in control of your life, therefore the encouragement of disease prevention, for example, may be difficult (Galanti, 2004). Relationship building is valued by Appalachian residents and is a stepping-stone to trust. The use of non-technical language is also appreciated in this region. Only 27% of SCA residents have an associate's degree or higher education level (Feser et al., 2014). Keeping these facts in mind when inviting research participants could enhance participation rates.

Financial and economic issues affecting Appalachia influence health care employment in this region. The per capita income is around $37,260 compared to the national average of approximately $46,049 in 2014. The median household income in Appalachian North Carolina is $34, 950 (Appalachian Regional Commission, 2014). The SCA unemployment rate of people ages 25-64 in civilian work environments is slightly higher than the national average – 8.4% in SCA versus 8.1% for the country as a whole. Entities such as the Appalachian Regional Commission aim to improve the financial outlook for this area (Appalachian Regional

Commission, 2011). Job in the manufacturing and professional services sectors are more recent additions to the traditional industrial and agricultural jobs in the area (Appalachian Regional Commission, 2016). However, certain efforts to initiate economic development in Appalachia as a whole report mixed results. Social and cultural roadblocks occur as accepting change takes time in this area. For example, attracting restaurants or businesses that serve alcohol have difficulties establishing in rural areas (Ezzell, Lambert, & Ogle, 2012). Even if an area has job opportunities for nurses, finding work for spouses may be difficult and affects nursing retention rates (Daniels et al., 2007).

Rural Nursing

Nurses working in rural areas have their own unique needs and understanding these needs may improve retention. Overlaying these characteristics onto South Central Appalachian characteristics only deepens understanding of nurses in this area. A few examples of how understanding the rural can inform practice and education are explored in the next few paragraphs.

Manahan and Lavoie (2008) reviewed the international literature regarding rural nurse retention in order to inform the Canadian rural nurse workforce. Improving the work environment to support autonomy, job variety, and reduce stress along with tailoring these suggestions to recognize the differing needs of younger and older nurses encourages retention. Recognizing the impact of family obligations presents as an important retention strategy and the authors suggested family friendly workplaces that include flexible scheduling and daycare. Spouses of nurses working in rural areas also require employment security and encouraging assisting in finding job opportunities aids in retention (Manahan & Lavoie, 2008).

Daniels et al. (2007) studied retention of rural health professionals in New Mexico. Rural based education influenced the decision to practice in rural areas as did hometown size, discipline, and graduation age. Nurses were a small portion of the study population, but the findings correspond to nurse specific studies in other areas. Loan forgiveness and past rural educational experience influenced recruitment, but retention was associated with continued financial benefits, job growth potential, and enjoyment of the community.

Professional isolation is noted to be a downside of rural nursing. Participating in a rural nurse residency program resulted in higher job satisfaction and lower perceived stress that participants in urban residency programs and the possible reduction of the sense of isolation provides an extra benefit (Bratt, Baernholdt, & Pruszynski, 2012). Molinari and Monserud (2008) linked rural nurse job satisfaction in the northwestern United States to having a love of rural life, desire to work near family, and having the ability to include rural values into practice. Enjoyment of the generalist role improved retention as well. Confidence in handling emergencies common to rural areas was associated with decreased intent to leave in rural nurse residency participants from 22 American states. These nurses also wanted a rural lifestyle in a particular area. Improving initial and continuing professional development to support work confidence along with highlighting the benefits of the community improved retention (Molinari, Jaiswal, & Hollinger-Forrest, 2011).

Support of new graduate rural nurse educational needs comprised a retention strategy by Dowdle-Simmons (2012). She noted feeling overwhelmed leads to other negative feelings such as discouragement and decreased morale and suggested preceptorship programs prevent this from happening. An appreciation of professional autonomy has previously been associated with rural nurses (Lee & McDonough, 2013) and was also noted as a factor to improve retention in a

study of rural nurses by Dotson et al. (2013). Autonomy improved the nurses' ability to incorporate their own values into practice which in return reduced stress.

These researchers describe characteristics associated with turnover and retention of rural nurses. Dotson et al. (2011) summarizes "determinants" of factors influencing nurses' choice of working in rural areas. Nurses who choose rural areas tended to be less concerned with cutting edge technology in their facilities, received nursing education in rural settings, already live in rural settings, and had family in the rural area. Exploring factors related to rural nurse characteristics in a specific geographic area adds context and deepens understanding of how to improve the experience of rural practice.

Retention

Retention is defined as remaining employed with one's current employer for a specified amount of time. Many nursing retention studies are conducted in the urban, inpatient setting. Few are conducted in rural settings of any kind. Gambino (2010) conducted a correlational study using survey data from 150 registered nurses in an urban setting in order to examine why nurses worked where they worked, how committed were they to their employer, and if they intended to remain with their employer until retirement. Age along with "normative commitment" proved to be correlated to retention in a positive manner. Normative commitment is commitment associated with a sense of obligation or loyalty. Age accounted for nine percent of the variance and normative commitment accounted for 14.4% of the variance. The author recommended fostering a sense of loyalty in nursing students as well as employees in order to improve retention (Gambino, 2010).

Retention of "Baby Boomers" along with "Generation Xers" was the subject of a summary of associated literature by Cordeniz (2002). While this article is a bit old, the phenomenon of the effect of age on retention is still relevant. Understanding the generational characteristics of nurses stands to aid in understanding how best to retain staff. The Generation X group is described as being loyal to themselves, expectant of intensive and individualized training, and preferring flexible scheduling. Tips to retain Baby Boomers include deferring retirement by using older nurses to train or tutor younger nurses and students, providing education during community events, and teaching patient education programs (Cordeniz, 2002). Generation Y and Millennials are now among the nursing rank and determining work expectations and preferences is essential to keep these individuals in the profession.

Knowing that over ten percent of new nurses change jobs after the first year inspired an initiative to improve retention in one large, urban hospital. Five areas were identified as important to fostering nurse retention. The first area was "on boarding" or orientation. The addition of information regarding workplace tips and support groups fleshed out the usual orientation agenda. Next was monthly rounding by nurse leaders to discuss various employee issues. "Social networking" opportunities through mostly off the job parties or gatherings were organized to improve group cohesiveness. Recognizing employee effort through awards and other honors were increased during the study period. Lastly, employees were encouraged to tackle workplace and community issues through program planning in order to encourage autonomy. As a result, voluntary turnover decreased by over 90% after program implementation. This illustrates the payoff of intentional planning by nursing leadership to reduce turnover (Hinson & Spatz, 2011).

Many nurse retention studies focus on job satisfaction; however, the *Practice Environment Scale of the Nursing Work Index Revised* illuminated the relationship between work environment and nurse retention (Blake, Leach, Robbins, Pike, & Needleman, 2013). This scale addresses nurse involvement in organizational issues, quality care, managerial factors, staffing, resources, and collegiality between physicians and nurses. An additional questionnaire assessed staff communication in the intensive care unit. Strong nursing leadership impacted intent to stay among the 415 pediatric intensive care nurses participating in the study (Blake et al, 2013).

A plethora of surveys and tools exist to evaluate retention in the workplace. Buffington, Zwink, Fin, Devine, and Sanders (2012) administered *The Revised Casey Fink Nurse Retention Survey* to a group of nurses working at a magnet hospital and found that supportive management influenced retention. This survey included information regarding factors such as work environment and professional support (Buffington et al., 2012). An adapted form of the *Causal Model* by Price and Mueller (as cited in Cheng, Kelly, Carlson, & Witt, 2014) includes intent to leave, job satisfaction, employment opportunities, pay satisfaction, work effort, autonomy, and other factors as methods to measure job satisfaction that leads to intent to stay. The Causal Model was employed in a study of 406 advanced practice nurses working in family planning clinics and the authors note that intent to stay went up with high family responsibilities and low levels of professional activities. Feeling well compensated for job effort and high levels of job variety also influenced intent to stay (Cheng et al., 2014).

Nurse retention in rural areas remains poorly studied. A literature review consisting mostly of Australian studies noted intrinsic motivation factors such as opportunities for autonomy and community connection improved retention but inadequate extrinsic motivation factors such as salary and professional support discouraged retention in rural or remote areas

(Campbell, McAllister, & Eley, 2012). Mbemba, Gagnon, Pare, and Cote (2013) conducted a small review of international nursing literature regarding interventions linked to improving nurse retention in rural and remote areas as well. Four major areas of intervention associated with improvement include professional educational development, professional support, adequate compensation, and improved scope of practice. Alignment of personal values with organizational values along with opportunities for autonomy and doing good improved retention in a large study (n=861) of registered nurses in the Southeastern United States (Dotson et al., 2014). Additional knowledge regarding retention in rural areas is a benefit to nursing.

Turnover

Nursing turnover occurs when nurses voluntarily leave their jobs. Several researchers address factors associated with this phenomenon. Hayes et al. (2012) conducted a literature review of 68 nurse retention studies and found most articles addressed acute care hospital nurses and did not factor in "off the job" factors such as family issues or availability of outside employment opportunities. Delobelle et al. (2011) led a study consisting of nurses from rural South Africa and noted above all satisfaction with leadership influenced retention after controlling for other factors such as age, and education. The authors also noted that half of the sample (n=143) considered changing jobs within the next two years -especially younger, more highly educated nurses (Delobelle et al., 2011). Stewart et al. (2011) studied nurses working in rural and remote areas of Canada and found a mix of job, community, and family factors influenced retention. Nurses planning to leave in the next year were more likely to be male, report high levels of job stress, had higher levels of education, did not have family obligations, were not happy with the community, and were not happy with the level of work autonomy, among other factors (Stewart et al., 2011). Job satisfaction and organizational commitment were

significant indicators of turnover prediction in a large study of new nurses in the United States (Brewer, Kovner, Greene, Tukov-Shuse, & Djukic, 2011). Gilmartin (2013) examined articles regarding nursing turnover from the past 30 years. Recommendations from the author included using theoretical influences from business management as past cooperative efforts between these two professions produced informative research in the past. The Job Embeddedness model was specifically cited as useful to nursing in this article due to the inclusion of multiple on the job and off the job factors (Gilmartin, 2013). In a study specifically comparing rural and urban nurses, a supportive work environment and opportunities for autonomy improved retention. Providing additional education to improve turnover rates was suggested specifically for rural nurses (Baernholdt & Mark, 2009). This information holds benefits for rural health care organizations aiming to design successful workplace environments.

Job Embeddedness

Including the concept of Job Embeddedness when examining factors associated with retention of nurses working in rural areas provides a rich description of the study population. First developed in 2001, the original authors sought to predict employee retention more comprehensively than other previously studied concepts such as job satisfaction and organizational commitment (Mitchell et al., 2001). Job Embeddedness (JE) is defined as the contextual mix of factors that lead to employee retention. These factors are also called "dimensions" by the study authors. In particular, three "dimensions" called "fit", "links", and "sacrifice" are divided into two categories each of community or "off the job" factors and organizational or "on the job" factors for a total of six dimensions. These factors are measured via a 40 item survey consisting of short answer and five point Likert scale responses. Scoring consists of determining the "mean of means" from the six dimensions (Mitchell et al., 2001).

"Fit" reflects how well a nurse assimilates to the organization and the community. Is the nurse adequately prepared for their position? Does the position fill a career dream? Is the community a place she feels comfortable? These factors allow the nurse to feel like the workplace and/or the community is a good match (Reitz & Anderson, 2011).

"Links" refers to how well connected the nurse is to the organization and the community. Does the nurse feel like part of a team? Does the nurse have family and friends in the area? If the nurse is married or in a relationship, does their partner have work in the same town? Are their children in school? A greater number of links is associated with higher levels of embeddedness (Reitz & Anderson, 2011).

"Sacrifice" represents hardships associated with separating from the organization and the community. Is the nurse financially supporting a family? Are there benefits (insurance for example) the nurse is depending on? Again, family plays a role. Would it create a sacrifice if the nurse left their position (Reitz & Anderson, 2011)? Any mix of these six factors paints the picture of what keeps a nurse from leaving their job (Mitchell et al, 2001).

Nurses have been included in JE studies since the original 2001 research conducted by Mitchell et al. Hospital employees, including nurses, were found to have higher levels of JE related to fit and sacrifice than grocery store employees that were also included in the study. A 2010 study by Reitz et al. specifically studied rural and urban nurses in Illinois. Job embeddedness accounted for 24% of the variance – beyond other demographic factors such as age, rural vs urban residence, salary, and gender. Halfer (2011) found that in nurses with up to three years of experience were more likely to leave if organizational "fit" JE scores were low. Rural hospitals can benefit from incorporating JE assessment according to a study by Stroth (2010). The author found that health care organizations working to improve embeddedness had

an average of 10% turnover rate compared to the 20% national average. Retention of specific age groups comprises another area of JE studies. Cohen (2006) noted that older nurse retention rates were tied to organizational fit and sacrifice issues such as scheduling, salary, and workplace safety. These researchers illustrate the variety of data obtained from use of JE Theory when examining factors related to nurse retention.

Theoretical Overview

Two main theoretical influences inform this study –Job Embeddedness Theory and Rural Nursing Theory.

Job Embeddedness Theory

Job Embeddedness Theory offers an understanding as to what keeps an employee on the job. Previous models and theories did not completely explain factors needed to predict who stays and who leaves a position and the authors felt a need to start over. For example, the "Unfolding Model of Turnover" attempts to describe how negative events or "shocks" moved employees who were otherwise satisfied with their jobs to quit but does not fully account for the variance of turnover behavior (Mitchell et al., 2001). Lewin's "Field Theory" and the concept of "embedded figures" paints a picture of individuals that are difficult to move due to web-like connections to their surroundings (Mitchell et al., 2001). The JE Theory includes a "web" made of the three main strands of "fit, links, and sacrifice" with additional strands leading from these three concepts to the organization and the community. The strands comprise the six dimensions of JE with fit referring to how well one fits in to the organization or community. Links refer to community and organizational connections such as friends or family. Sacrifice occurs when connections to the organization or community are strong enough to cause distress if one were to leave. As a result, an inverse relationship exists between JE and intent to leave and voluntary

turnover (see Figure 2). High levels of JE are associated with low levels of intent to leave and voluntary turnover. Any arrangement of elevated or decreased levels of the six dimensions determine the JE level and are unique to setting and location. The JE Scale weights each dimension equally by using an aggregate score for each dimension, and then a mean of the six dimensional means is determined for the final score (Mitchell et al, 2001). Reitz and Anderson (2011) found the theory was predictive of intent to leave and voluntary turnover in a variety of populations in 15 studies selected for a literature review.

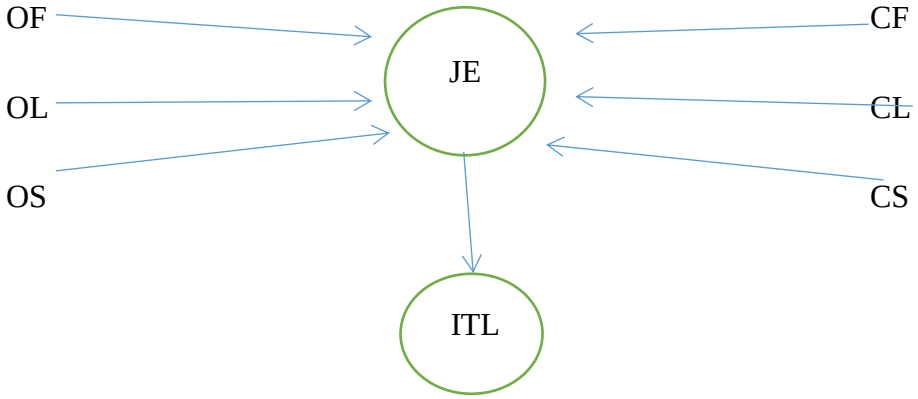

Figure 2 JE Theory. Key - OF=organizational fit, OL=organizational links, OS=organizational sacrifice, CF=community fit, CL=community links, CS=community sacrifice, ITL=intent to leave (source: Mitchell et al, 2001).

The contextual aspect of JE theory makes it useful in studying the nursing workforce in a particular geographical area. Although on a small scale, one could expect that generalizable results would paint a picture of an ideal scenario for improving embeddedness in NC-SCA nurses. Reitz and Anderson (2011) employed the use of JE theory in studying urban and rural nurses in Illinois.

Rural Nursing Theory

Understanding theoretical influences on rural nursing stands to improve understanding of rural nurse retention. Rural Nursing Theory was introduced in 1989 (Long & Weinert, 2013) in order to aid nurses in addressing the unique needs of rural residents. Rural residents define health as ability to work and do normal activities and this may clash with the definition of health taught in nursing school. The authors of the theory also note that rural residents rely on "insiders" including family and friends for support. Nurses not from the area may be considered "outsiders". This highlights the importance of community "fit" and meshes with JE Theory well. The theory also describes the isolation and "role diffusion" experienced by rural nurses. Organizational "links" included in Job Embeddedness Theory are a potential source of measurement of this tenet of Rural Nursing Theory. Sacrificing one's anonymity is a stressor noted in Rural Nursing Theory and correlates to the community sacrifice JE factor (Long & Weinert, 2013; Mitchell et al, 2001).

As Rural Nursing Theory was developed in Montana, it is fair to ask if this theory is useful to nurses in other geographic areas. The phenomenon of "role diffusion" was noted in a variety of health care providers in the United States, Australia, and New Zealand, for example (Lee & McDonough, 2013). Having to wear many hats is stressful and can impair retention. Knowing there are nurses who only focus on one thing (ICU patients with cardiac issues for example) can make one long for a simpler setting.

Conger and Plager (2012) noted that understanding the concepts of this theory aided APRN preparation for rural practice in rural Arizona. Learning how to anticipate barriers to retention such as professional and social isolation (akin to JE "links") informed these nurses of the need to find sources of support such as other health professionals (either in person or via

telemedicine), professional groups, referral facilities, and backup coverage. Spending a portion of their education in rural areas also improved the sense of "connectedness" and reduced the "outsider" effect and culture shock (Conger & Plager, 2012).

Williams, Andrews, Zanni, and Fahs (2012) conducted a literature review and found that although rural nurse research published in journals has increased over the past 20 years, the use of theory could be improved. Out of 77 articles citing a theory, the most commonly used theory – Rural Nursing Theory- was only cited six times. Reducing "fragmentation" in use of theory strengthens rural research and is an incentive to include Rural Nursing Theory in more studies (Williams et al., 2012). Figure 3 illustrates a fusion of JE and Rural Nursing Theories.

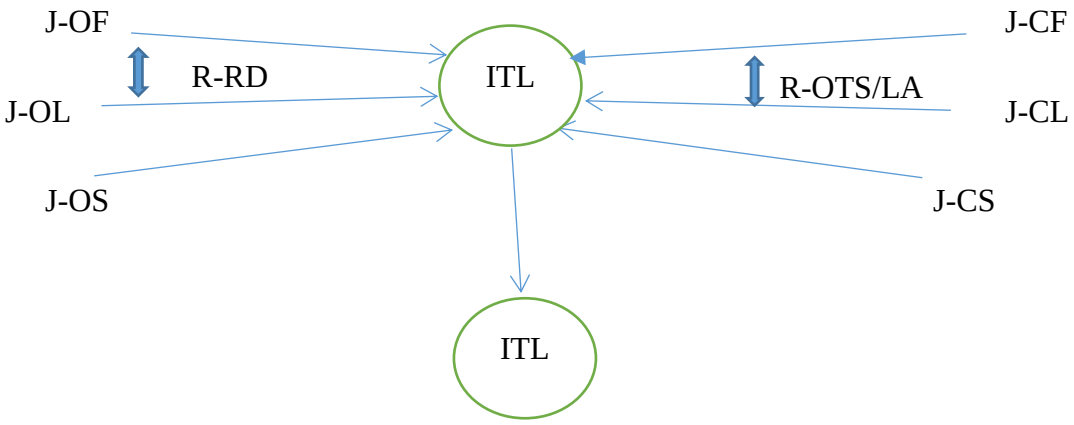

Figure 3. Fusion of JE Theory (J) and Rural Theory(R). Key-OF=organizational fit, OL=organizational links, OS-organizational sacrifice, CF=community fit, CL=community links, CS=community sacrifice, ITL=intent to leave, OTS-Outsider, LA-Loss of anonymity, RD=role diffusion (sources: Long & Weinert, 2013; Mitchell et al., 2001).

Conclusion

Research regarding the nursing workforce in NC-SCA is lacking and literature specific to job embeddedness in nurses living in this area is all but non-existent. The purpose of this study is to examine this specific population in order to ascertain the level of JE in order to offer guidance regarding retention these nurses. Including the concepts of turnover and retention in this study provides additional context as to what influences nurses to stay in their jobs. Rural

Nursing Theory and Job Embeddedness Theory provide a conceptual framework to support a culturally appropriate research effort in NC-SCA. Two authors of the original 2001 Job Embeddedness study recently published a review of how well the concept and theory have held up over the years. After examining numerous Job Embeddedness studies they found that intention to stay is associated with the Job Embeddedness score. Also, organizations invested in improving embeddedness levels note improvement in job performance and citizenship as well (Lee, Burch, & Mitchell, 2014). Employers who anticipate the negative effects of role diffusion and being an outsider as stated in Rural Nursing Theory by increasing opportunities for nurses to deepen fit and links in the organization and community may improve JE (Long & Weinert, 2013; Mitchell et al., 2001). Findings from this study stand to inform employers of nurses in the NC-SCA area of characteristics associated with rural nurse retention.

CHAPTER 3

METHODS

The research questions for this study are non-experimental in nature. Correlational studies examine relationships between variables without manipulation of the independent variable. The sampling plan, instrumentation, data collection method, key variables, and data analysis plans are discussed in this chapter. Safeguards to protect human subjects along with limitations and challenges are also discussed.

Research Design

A non-experimental, quantitative, cross sectional design addresses the research questions in this study (Polit & Beck, 2012). This study is non-experimental in that no variable manipulation occurred through the collection of demographic information and survey data. Quantitative methods allow researchers to uncover trends, examine correlations, and attempt prediction of outcomes (Polit & Beck, 2012). Cross sectional designs assess data from a single point in time. As the purpose of this study was to ascertain the level of Job Embeddedness in nurses in NC-SCA at one point in time, this is an appropriate study approach (Polit & Beck, 2012).

Sampling Plan

Licensed practical nurses, registered nurses (N) and advanced practice nurses (APRN)-[(nurse practitioners (NP), nurse midwives (NM), clinical nurse specialists (CNS), and nurse registered nurse anesthetists (CRNA)] actively working and in good standing in NC-SCA comprised the study population. Licensure reports available for a fee from the North Carolina State Board of Nursing provided the information required to identify participants (North Carolina Board of Nursing, 2016). Inclusion criteria included having an Appalachian home and work

address, a valid email address, possessing the ability to speak and read English, having an active nursing license, and being currently employed. Exclusion criteria included nurses without an Appalachian home and work address, an invalid email addresses, not English proficient, not currently working (i.e. no work address) or having an inactive license. A power analysis performed using the 12 key variables, a medium effect size, an alpha level of 0.5, and 80% power resulted in a recommended sample size of 127 (Soper, 2016).

Instrumentation

A structured questionnaire containing a demographic form adapted from the National Institute of Nursing Research (NINR) (NINR, 2016) and the *Job Embeddedness Scale* was e-mailed to potential participants. The demographic form reflected the first 12 independent variables as key variables (NINR, 2016). The *Job Embeddedness Scale* constructed by Mitchell et al, (2001) will be used to collect JE information.

The *Job Embeddedness Scale* consists of 40 questions. The original authors found the instrument to have an overall Cronbach alpha of 0.89 in a hospital population. The individual subscales have the following alpha scores: fit/community 0.79; fit/organization 0.86, links/community 0.50, links/organization 0.62, sacrifice/community 0.59, and sacrifice/organization 0.82 (Mitchell et al, 2001). Cronbach alpha *Job Embeddedness Scale* calculations for this study include: overall alpha of 0.928, fit/community 0.889, fit/organization 0.927, links/community 0.501, links/organization 0.689, sacrifice/community 0.643, and sacrifice/organization 0.917. Permission to use the scale was obtained from Dr. Thomas Lee, an original author (T. Lee, personal communication, February 12, 2016).

The level of JE reflects the total standardized JE z-score (defined by mean of the means of the six dimensions measured with Likert scales) for the population. A majority of the scale

consists of Likert scale questions. The Likert scores reflect choices of 1 for strongly agree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. Some questions required a numerical answer (i.e. how long have you worked at your current position – in years). These questions were initially answered by the participant in numerical format. The data was then converted to five categories 1 for 1, 2 for 1-2, 3 for 3-5, 4 for 6-10, and 5 for greater than 10. A small portion of the *Job Embeddedness Scale* required yes/no answers. These responses were converted to 1 for no and 2 for yes. The question asking if the spouse worked out of the home was coded as 3 (O. Reitz, personal communication, May 15, 2017). Z-scores were then calculated in order to standardize the responses to the dimensions as each dimension included a varying number of questions. Z-scores are based on a normal distribution pattern and reflect the number of standard deviations above and below the mean. The mean of a z-score is zero and the standard deviation is 1 (Cronk, 2012).

Data Collection Methods and Procedures

Participants were asked to complete surveys within one week of receipt of the online Checkbox survey. Reminders were sent three weeks after the initial email invitation (see Appendix A).

Ethical Considerations

IRB approval was obtained from the East Tennessee State University Office for the Protection of Human Research Subjects. Participants could quit the survey at any time without penalty. No personal identifiers were required to complete the survey.

Key Variables

Independent Variables

1. Location – work address zip code.

2. Type of nurse – LPN, RN, or APRN (NP, NM, CNS, or CRNA).
3. Educational background – highest level of education (Certificate, ADN, BSN, MSN, DNP, or PhD).
4. Length of time at position – measured in years.
5. History of residing in a rural area - measured by asking for a yes/no answer and/or History of receiving all or part of nursing education in a rural area - measured by asking for a yes/no answer
6. Age – measured in years using birthdate.
7. Intent to stay – intends to stay in current position for the next year (yes/no).
8. Intent to leave – intends to leave current position in the next year (yes/no)
9. Nurse residence zip code – list the zip code.
10. Distance to work from home in miles – enter number of miles.
11. Time to work from home in minutes – enter number of minutes.

Dependent Variable

1. JE – the array of community and organizational "links, fit, and sacrifice" that predicts turnover and intent to leave one's position as determined by the Mitchell et al. (2001) *Job Embeddedness Scale.*

Data Analysis and Management

Descriptive statistics such as mean, median, and mode were used to report demographic data. In order to ease data analysis, demographic data was converted to the nominal level when appropriate (i.e. no=1, yes=2). Missing data identified in SPSS were coded as system or user missing data (Polit & Beck, 2012).

The data analysis plan for each specific aim is listed below:

1. What is the (JE) score of nurses in NC-SCA as measured by the Mitchell et al (2001) *Job Embeddedness Scale*? Descriptive analysis will be used to report scores of JE along with the means of the six individual job embeddedness measures for each group (Plicta & Kelvin, 2013).

2. Is there a difference in JE scores between nurses working in rural areas versus nurses working in urban areas in NC-SCA? An independent sample t-test will be used to report differences between rural (RUCA zip code designation 4-10.6) and urban (RUCA zip code designation 1-3) nurse JE mean scores (Plicta & Kelvin, 2013).

3. What are the JE characteristics of highly embedded nurses working in NC-SCA? The JE individual measures will be ranked by mean to illustrate characteristics of the highly embedded nurses (top 25% of mean total JE scores). A correlation will also be employed to compare the means of the individual dimensions on JE in this population (Plicta & Kelvin, 2013).

4. Is intent to leave predictive of low levels JE in nurses working in NC-SCA? Linear regression will be used to determine the strength of intent to leave on nurses working in NC-SCA with low levels of JE (Plicta & Kelvin, 2013).

5. What factors predict job embeddedness scores for nurses working in NC-SCA? Multiple regression will be used to ascertain if any particular factors predict JE scores (Plicta & Kelvin, 2013).

Definition of Rural

For this study, Rural Urban Commuting Area (RUCA) zip code approximations will be linked to zip code data from the demographic survey section in order to further ascertain rural/urban address classifications. In 1998, the Office of Rural Health Policy and the

Department of Agriculture used United States Census data to create this zip code coding system. A few years later, zip code "approximations" were calculated in order to allow greater precision in location designation as some counties (including NC-SCA counties) have a mix of rural and urban population centers. RUCA zip code categories range from 1 for large metropolitan areas to 10 for isolated rural areas. The codes are then further stratified by zip code reflecting the fact that within one county a mixture of RUCA codes may exist. For data analysis purposes, responses were coded as Metropolitan (RUCA zip code scale 1-3), Large Rural (RUCA zip code scale 4-6.1), Small Rural (RUCA zip code scale 7-9.2), or Isolated rural (RUCA Zip code 10-10.6). These categories were converted to the nominal scale and denoted as one for metropolitan, two for large rural, three for small rural, and four for isolated rural (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016: Plicta & Kelvin, 2013).

Data Cleaning

The data cleaning process involved the following steps. Twenty-four participants answered "yes" to intent to stay and "yes" for intent to leave their current position in the next year. These responses were omitted from the final analysis of demographic information Nurses with work addresses not in Appalachia were excluded from the data analysis. Three participants that did not complete the entire *Job Embeddedness Scale* and these surveys were excluded from data analysis. Inaccurate responses such as negative age were excluded from data analysis.

Protection of Human Subjects

No physical or emotional harm was expected from participation in this study and all participants were adults. An email containing informed consent information along with the survey link was sent to potential participants. Participation implied consent and participation

was without cost or compensation. The consent document also served as the invitation to participate in the study (see Appendix A). Checking "I agree" indicated that the participant had read the consent, was over the age of 18, and agreed to participate. The "I agree" button opened the survey where the participants were asked a second time to agree to the study terms before completing the survey (see Appendix B). Participants were free to cease participation without penalty at any time during survey completion until the "submit" button was clicked and the survey was completed. Benefits to participation included furthering nursing knowledge related to Job Embeddedness of nurses working in NC-SCA. Participants completed the survey privately in a place of their choice and no identifiers other than demographic data were associated with responses. Data from the survey was downloaded to a secure server at the East Tennessee State University College of Nursing (ETSU CON) and any data access will occur via password protected means. Data received from the North Carolina Board of Nursing was stored in this manner. Data on the secure server at ETSU CON will be destroyed after graduation. A copy of the data was transferred to an encrypted flash drive and stored in a locked box in the principal investigator's home for six years and will be given to the Center for Nursing Research at the ETSU College of Nursing for storage and then destroyed.

Limitations and Challenges

Self-report on surveys relies on the truthfulness of the participants. In addition, cross sectional studies by nature do not examine results over time, limiting the generalizability of the findings (Polit and Beck, 2012)

Conclusion

Analysis of data collected in this manner will fulfill the study purpose which is to ascertain the level of JE of nurses working in NC-SCA. Discussion of the components

associated with highly embedded nurses will provide employers in this region with attributes to seek in potential employees and organizational attributes to amend or continue in order to improve retention. Findings will also add to the rural nursing literature and further test the *Job Embeddedness Scale* in a rural population.

CHAPTER 4

RESULTS

Offering guidance regarding retention of nurses working in NC-SCA by determining the level of job embeddedness comprised the purpose of this research. A non-experimental, quantitative, cross sectional design addressed research questions in this study (Polit & Beck, 2012). Results of the data analysis of study aims and assumptions are included in this chapter.

Participant Information

Contact information for the desired sample population was purchased from the North Carolina Board of Nursing. After obtaining the email lists from the North Carolina Board of Nursing, the lists were transferred to new Microsoft Excel (Microsoft Office Professional Plus 2013) spreadsheets. By alphabetizing county names, those nurses who were not from Appalachian counties were deleted - leaving 29,397 potential participants. Then, those nurses who did not provide an email address were deleted and the sample population was capped at 28,000. The email addresses from all types of nurses in the Appalachian counties were compiled into yet another Microsoft Excel (Microsoft Office Professional Plus 2013) spreadsheet in order to be uploaded to the invitation email. Seven hundred seventy-eight or 2.78% of email invitations "bounced back" due to invalid email addresses. The number of successful invitations sent totaled 27,222.

Survey Distribution

Actively working licensed practical nurses, registered nurses, and advanced practice nurses (nurse practitioners, certified nurse midwives, clinical nurse specialists, and certified registered nurse anesthetists) from 29 North Carolina counties included in South Central

Appalachia comprised the study population. An online "Checkbox" survey (www.checkbox.com) was sent along with the consent document to the potential participants. Checkbox survey data was downloaded into IBM SPSS Statistics Version 24 after data collection was complete.

Results

Eight hundred eighty-nine responses were returned and 852 agreed to participate, reflecting a 3.18 percent response rate. Those reporting home or work addresses not in Appalachia were then excluded from the remainder of the data analysis (n=70) leaving an all Appalachia study population of 782. More than 100 participants who clicked "I agree" did not answer part or all of the entire survey. The reason for this is not clear. These factors bring the response rate to 2.3 percent or 619 responses that could be analyzed.

Table 1 depicts the breakdown of work address zip codes divided into RUCA categories created for this study. "Metropolitan" represents RUCA zip code areas 1-3 (metropolitan areas), "Large rural" represents RUCA zip code areas 4-6.1 (large rural areas), "Small rural" represents RUCA zip code areas 7-9.2 (small rural areas), and "Isolated" represents RUCA zip code areas 10-10.6 (isolated small rural areas) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 1

Survey Participants by RUCA Zip Code Category

RUCA Zip Code Category*	N	Percent
Metropolitan	414	66.9%
Large Rural	78	12.6%
Small Rural	45	7.3%
Isolated	82	13.2%
Total	619	100%

Note: * RUCA= Rural Urban Commuting Area. Metropolitan = RUCA code areas 1-3 (metropolitan areas), Large rural =RUCA code areas 4-6.1 (large rural areas), Small rural = RUCA code areas 7-9.2 (small rural areas), and Isolated = RUCA code areas 10-10.6 (isolated small rural areas) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Demographic data collected are represented in the tables below. The demographic variables were chosen to provide a rich picture of the participants and provide additional context to the study. Table 2 contains the highest level of education (education level) of study participants for the various RUCA work zip code categories. The most frequently reported level of education among participants was a baccalaureate degree.

Table 2

Total Study Population - Education Level by RUCA Zip Code Category

RUCA	Metro	Total Rural	Total Study Population
N=	413	204	617
Certificate	19(4.6%)	12(5.8%)	31(5%)
ADN	103(24.9%)	51(25%)	154(25%)
BSN	166(40%)	78(38.2%)	244(39.5%)
MSN	108(26.1%)	49(24%)	157(25.4%)
PhD	4(.9%)	7(3.4%)	11(1.8%)
DNP	10(2.4%)	4(1.9%)	14(2.3%)
Other Ed	3(.7%)	3(1.5%)	6(1%)

Note: Metropolitan = RUCA zip code areas 1-3, Rural = RUCA zip code areas 4-10.6. Total Study Population = RUCA zip code areas 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

The education level reported by the NC-SCA nurses working in rural areas is noted in Table 3. Again, the baccalaureate degree was the most common degree.

Table 3

Rural Only - Education Level by RUCA Zip Code Category

RUCA	Lg. Rural	Sm. Rural	Isolated	Total Rural
N=	78	44	82	204
Certificate	4(5.1%)	4(9.1%)	4(4.9%)	12(5.8%)
ADN	22(28%)	5(11.3%)	24(29%)	51(25%)
BSN	28(35.9%)	15(34%)	35(42.7%)	78(38.2%)
MSN	19(24.4%)	15(34%)	15((18.2%)	49(24%)
PhD	2(2.6%)	3(6.8%)	2(2.4%)	7(3.4%)
DNP	2(2.6%)	0	2(2.4%)	4(1.9%)
Other Ed	1(1.3%)	2(4.5%)	0	3(1.5%)

Note: Large rural =RUCA code areas 4-6.1 (large rural areas), Small rural = RUCA code areas 7-9.2 (small rural areas), and Isolated = RUCA code areas 10-10.6 (isolated small rural areas). Total Rural = RUCA zip code areas 4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

Table 4 illustrates the job titles of the whole study participants. Of the NC-SCA nurses from all RUCA zip code areas, the overwhelming majority were registered nurses.

Table 4

Total Study Population - Title by RUCA Work Address Zip Code Category

RUCA	Metro	Total Rural	Total Study Population
Title N=	413	205	617
LPN	23(5.6%)	16(7.8%)	39(6.3%)
RN	330(79.9%)	159(77.6%)	489(79%)
NP	46(22.5%)	22(10.7%)	68(11%)
CNM	1(.2%)	1(.7%)	2(0.3%)
CNS	5(1.2%)	0	5(0.8%)
CRNA	7(1.7%)	7(3.4%)	14(2.3%)

Note: Metropolitan = RUCA zip code areas 1-3 (metropolitan areas), Rural = RUCA zip code areas 4-10.6. Total Study Population = RUCA zip code areas 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

In the rural population of participants, the registered nurse predominates (see Table 5).

Table 5

Rural Only - Title by RUCA Zip Code Category

RUCA	Lg. Rural	Sm. Rural	Isolated	Total Rural
Title N=	78	45	82	205
LPN	5(6.4%)	4(8.9%)	7(8.5%)	16(7.8%)
RN	61(78%)	32(71.1%)	66(80.5%)	159(77.6%)
NP	8(10.3%)	5(11.1%)	9(11%)	22(10.7%)
CNM	1((1.3%)	0	0	1(.7%)
CNS	0	0	0	0
CRNA	3(3.8%)	4(8.9%)	0	7(3.4%)

Note: Large rural =RUCA code areas 4-6.1 (large rural areas), Small rural = RUCA code areas 7-9.2 (small rural areas), and Isolated = RUCA code areas 10-10.6 (isolated small rural areas) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). 2016). LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

Table 6 contains demographic data expressed in means regarding work history, work commute, and age of study participants. Other than years in current position, the other demographic findings are similar in this population.

Table 6

Total Study Population - Demographic Data (Means)

Population	Metropolitan	Rural	Total Study Population
Years in Current Position	8.73(8/84sd) (n=390)	7.38(7.38sd) (n=188)	8.29(8.41sd) (n=578)
Age(years)	47.94(11.23sd) (n=361)	47.80(11.21sd) (n=181)	47.89(11.24sd) (n=542)
Miles to Work	14.58(12.12sd) (n=391)	14.59(12.85sd) (n=186)	14.58(12.35sd) (n=578)
Drive time In minutes	21.31(14.74sd) (n=390)	20.81(15.68sd) (n=189)	21.15(15.04sd) (n=579)

Note: Metropolitan = RUCA zip code areas 1-3 (metropolitan areas), Rural = RUCA zip code areas 4-10.6. Total Study Population = RUCA zip code areas 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 7 contains demographic data expressed in means from the nurses living in RUCA zip codes areas 4-10.6 – the rural population. In the rural RUCA zip code areas, a notable difference from the whole study population is fewer years in current position.

Table 7

Rural only - Demographic Data (Means)

Population	Large Rural	Small Rural	Isolated	Total Rural
Years in Current Position	7.33(6.53sd) (n=70)	7.37(8.02sd) (n=41)	7.43(7.85sd) (n=77)	7.38(7.38sd) (n=188)
Age	46.99(10.92sd) (n=68)	47.41(11.51sd) (n=39)	48.74(11.40sd) (n=74)	46.02(14.26sd) (n=188)
Miles to Work	15.69(13.89sd) (n=70)	13.00(13.40sd) (n=40)	14.41(15.56sd) (n=76)	14.59(12.85sd) (n=186)
Drive time In minutes	23.54(16.83) (n=70)	18.33(14.54sd) (n=43)	19.71(15.02sd) (n=76)	20.81(15.68sd) (n=189)

Note: Large rural =RUCA code areas 4-6.1 (large rural areas), Small rural = RUCA code areas 7-9.2 (small rural areas), Isolated = RUCA code areas 10-10.6 (isolated small rural areas), and Total rural=RUCA code areas 4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). 2016).

Table 8 contains information regarding rural living and education history, intent to leave, intent to stay, and home zip code information. A history of living in a rural area is common in all study participants but is very high (95%) with the rural (RUCA zip code categories 4-10.6) study population. A little over half the whole study population report a history of receiving all or part of their education in rural areas and most intend to stay in their current job.

Table 8

Total Study Population - Additional Demographic Data

Population	Metro	Rural	Total Study Population
History of	288	193	481
Living in	70.1%	95.07%	78.2%
Rural Area	(n=411)	(n=203)	(n=615)
History of	195	134	329
Rural	47.33%	65.37%	53.4%
Education	(n=412)	(n=205)	(n=616)
Intent to stay-	339	155	494
Yes	83.08%	76.73%	79.8%
	(n=408)	(n=202)	(n=610)
Intent to stay-	69	47	116
No	16.87%	23.26%	19.3%
	(n=409)	(n=202)	(n=610)
Intent to	80	53	133
Leave-	19.80%	26.50%	22.0%
Yes	(n=404)	(n=200)	(n=604)
Intent to leave-	324	147	472
No	80.19%	73.50%	78.1%
	(n=404)	(n=200)	(n=604)
Most			
Common			
Home Zip	Metro	Isolated	Metro
(mode)	(n=420)	(n=202)	(n=612)

Note: Metropolitan = RUCA zip code areas 1-3 (metropolitan areas), Rural = RUCA zip code areas 4-10.6. Total Study Population = RUCA zip code areas 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 9 contains additional demographic data for the rural (RUCA zip code areas 4-10.6) areas. Not surprisingly, most of the study participants from rural (RUCA zip code categories 4-10.6) areas have a history of living in a rural area. Over half of these participants also received

all or part of their education in a rural area. Participants from small rural areas had the lowest percentage of nurses who plan to stay in their current job. The most frequently reported home zip code areas mirrored the work zip code areas.

Table 9

Rural Only - Additional Demographic Data

Population	Large Rural	Small Rural	Isolated	Total Rural*
History of	76	41	76	193
Living in	97.44%	91.11%	95.00%	95.07%
Rural Area	(n=78)	(n=45)	(n=80)	(n=203)
History of	49	31	54	134
Rural	62.8%	68.88%	66.66%	65.37%
Education	(n=78)	(n=45)	(n=81)	(n=205)
Intent to stay-	59	29	67	155
Yes	75.64%	64.44%	83.75%	76.73%
	(n=78)	(n=45)	(n=80)	(n=202)
Intent to stay-	18	16	13	47
No	23.37%	35.55%	16.25%	23.26%
	(n=77)	(n=45)	(n=80)	(n=202)
Intent to	20	16	17	53
Leave-	26.66%	35.55%	21.25%	26.50%
Yes	(n=75)	(n=45)	(n=80)	(n=200)
Intent to leave-	55	29	63	147
No	73.33%	64.44%	77.77%	73.50%
	(n=75)	(n=45)	(n=81)	(n=200)
Most Common	Lg. Rural	Sm. Rural	Isolated	Isolated
Home Zip (mode)	(n=77)	(n=44)	(n=80)	(n=202)

Note: Large rural =RUCA code areas 4-6.1 (large rural areas), Small rural = RUCA code areas 7-9.2 (small rural areas), and Isolated = RUCA code areas 10-10.6 (isolated small rural areas). *All Rural-RUCA codes 4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

The *Job Embeddedness Scale* comprised the remainder of the data gathering process. This 40 item survey consisted of a mix of short answer and five point Likert scale responses.

Scoring consists of determining the "mean of means" from the six dimensions after standardizing the results into z-scores (Mitchell et al., 2001). A text box for additional comments was included at the end of the survey.

A power analysis performed using the 12 key variables, a medium effect size, an alpha level of 0.5, and 80% power resulted in a recommended sample size of 127 (Soper, 2016). The sample size of this study exceeded this amount.

Specific Aims and Assumptions

Aim 1

Specific Aim 1. What is the Job Embeddedness (JE) score of nurses in NC-SCA as measured by the Mitchell et al., (2001) *Job Embeddedness Scale*?

Assumption 1. There will be high (above the mean) levels of embeddedness in nurses working in NC-SCA (RUCA Zip Code areas 1-10.6).

Assumptions associated with mean includes using interval or ratio level data and that the distribution is normal or with minimal skew (Cronk, 2012). Likert scale responses were converted to z-scores which are based on a standard normal distribution with a mean of 1 and are considered interval-type forms of data (Cronk, 2012). The total JE z-score for the total study population of NC-SCA nurses was -0.0073 (see Table 10). Scores for individual dimensions are also provided in Table 10. This score is just below zero and is therefore below the mean and would not be considered "high" according to the definition stated in the assumption. The assumption was not supported. Table 10 illustrates the JE score total mean as well as the means of each JE dimension for the study population as a whole.

Table 10

Total Study Population - JE Dimension Z-score Results*

Dimension	N	Minimum	Maximum	Mean	Standard Deviation
Sacrifice-Community	591	-2.11	1.01	-0.0114	0.77539
Sacrifice-Organization	588	-2.13	1.34	0.0103	0.74573
Links-Community	591	-1.58	1.10	-0.0042	0.60157
Links-Organization	592	-1.83	1.41	0.0035	0.60975
Fit-Community	608	-3.35	0.79	-0.0057	0.84379
Fit-Organization	603	-2.89	1.01	0.0059	0.79238
Total JE Scale Z- Score	608	-2.11	1.01	-0.0073	0.51179

Note: Total Study Population = RUCA zip code areas 1-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Examining different portions of the study population provides additional insight. Table 11 shows the JE scale results for the nurses working in metropolitan areas (RUCA zip code categories 1-3) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). The total JE scale score mean is a bit higher than the total study population JE scale score mean.

Table 11

Metropolitan Population – JE Dimension Z-score Results

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Fit Organization	404	-2.89	1.01	0.0163	0.79913
Fit-Community	407	-3.35	0.79	0.0146	0.86788
Links-Organization	395	-1.83	1.41	0.0271	0.62318
Links Community	393	-1.58	1.09	-0.0502	0.59234
Sacrifice-Organization	391	-2.13	1.34	0.0564	0.72447
Sacrifice-Community	394	-3.45	0.97	-0.0389	0.81836
Total JE Scale Z- Score	407	-2.00	0.98	-0.0020	0.51763

Note: Metropolitan = RUCA zip code areas 1-3 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 12 contains the JE scale score means for those nurses working in rural areas (RUCA zip code areas 4-10.6) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016). The total JE scale score mean is lower than the total JE Scale score mean for the total study population.

Table 12

Rural Population – JE Dimension Z-score Results

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Fit Organization	199	-2.56	1.01	-0.0153	0.78006
Fit-Community	201	-2.94	0.79	-0.0468	0.79329
Links-Organization	197	-1.58	1.41	-0.0437	0.58057
Links Community	198	-1.42	1.10	0.0871	0.61078
Sacrifice-Organization	197	-2.04	1.34	-0.0813	0.78006
Sacrifice-Community	197	-2.11	0.97	0.0435	0.68000
Total JE Scale Z- Score	201	-2.11	1.01	-0.0180	0.50087

Note: Rural = RUCA zip code areas 4-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 13 contains the JE scale score means for those nurses working in large rural areas (RUCA zip code areas 4-6.1) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 13

Large Rural-JE Dimension Z-score results

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Fit-Organization	77	-2.54	1.01	-.0218	0.76753
Fit-Community	77	-2.94	.79	-.1035	.81703
Links-Organization	76	-1.01	1.37	-.0473	.56059
Links-Community	77	-1.42	1.05	.0954	.60409
Sacrifice-Organization	77	-1.96	1.18	-.1247	.76894
Sacrifice-Community	77	-1.83	.97	.0125	.69339
Total JE Scale Z- Score	77	-1.36	.90	-.0320	.47889

Note: Large rural=RUCA zip code category 4-6.1 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 14 contains the JE scale score means for those nurses working in small rural areas (RUCA zip code areas 7-9.2) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 14

Small Rural-JE Dimension Z-Score Results

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Fit-Organization	43	-2.56	1.01	-0.1822	0.91440
Fit-Community	44	-1.65	0.79	0.0694	0.68450
Links-Organization	43	-1.58	0.88	-0.0993	0.64231
Links-Community	43	-1.34	1.10	0.0579	0.67823
Sacrifice-Organization	43	-1.82	1.17	-0.2933	0.75511
Sacrifice-Community	43	-2.11	0.97	0.0358	0.67249
Total JE Scale Z- Score	44	-1.12	0.90	-0.0519	0.49425

Note: Small Rural=RUCA Zip Code Category 7-9.2 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

The JE Scale scores for the Isolated Rural NC-SCA nurses shown in Table 15 are positive in four of the six dimensions.

Table 15

Isolated Rural-JE Dimension Z-Score Results

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Fit-Organization	79	-1.69	1.01	0.0820	0.70387
Fit-Community	80	-2.70	.79	-0.0561	0.82778
Links-Organization	78	-1.06	1.41	-0.0095	0.56913
Links-Community	78	-1.42	1.05	0.0950	0.58543
Sacrifice-Organization	77	-2.04	1.34	0.0805	0.78040
Sacrifice-Community	77	-2.04	.97	0.0789	0.67786
Total JE Scale Z- Score	80	-2.11	1.01	0.0140	0.52883

Note: Isolated Rural=RUCA Zip Code Category 10-10.6(Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Of the RUCA zip code categories identified in this study, the nurses working in isolated rural areas had the highest JE scale score mean.

Aim 2

Specific Aim 2. Is there a difference in JE scores between nurses working in rural areas versus nurses working in urban areas in NC-SCA?

Assumption 2. The JE score in nurses working in rural areas will be lower than that of nurses working in metropolitan areas.

Table 16 displays the JE scale score means for each RUCA zip code category along with the top two JE Dimension means and top Sub-Dimension items for each group. All rural JE scores are lower than the metropolitan JE scores with the exception of the nurses working in the

isolated rural RUCA zip code category. The assumption is supported in that the total rural JE scale score mean is lower than the nurses working in metropolitan areas.

Table 16

Total Study Population - Two Highest JE Dimensions and Sub-Dimensions

Population	JE Scale Score	Top 2 JE Dimensions	Top Sub-Dimension
Total Study Population	-0.0073	Fit-Organization	Co-workers are similar to me
		Sacrifice-Organization	Retirement Benefits
Metropolitan	-0.0020	Links-Organization	Length of time in industry
		Sacrifice-Organization	Good Benefits
Large rural	-0.0320	Sacrifice-Community	Respected in community
		Links-Community	Having Family Near
Small Rural	-0.0519	Fit-Community	Suitable Weather
		Links-Community	Home owner
Isolated	0.0140	Links-Community	Home Owner
		Fit-Organization	Good professional growth
All Rural	-0.0180	Links-Community	Home owner
		Sacrifice-Community	Respected in community

Note: Total study population= RUCA zip code areas 1-10.6. Metropolitan = RUCA zip code areas 1-3), Large Rural =RUCA zip code areas 4-6.1, Small rural= RUCA zip code areas 7-9.2, Isolated = RUCA zip code areas 10-10.6, and All Rural=RUCA zip code areas 4-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

To further examine the aim, an independent sample t-test calculation was performed. The independent sample t-test assumptions include using data from two separate groups. In this case, the use of these two populations (rural and urban/metropolitan) meets this assumption (Cronk, 2012). A new variable was created for data analysis and metropolitan was labeled as 1 and rural was labeled as 2. An independent samples t-test was calculated and the mean JE score

for nurses working in rural areas (RUCA Categories 4-10.6) was -0.0180 and for nurses working in metropolitan areas (RUCA Category 1-3) was–0.0020. The mean Job Embeddedness score of the rural nurse population was less than the mean of the metropolitan nurse population. However, the independent samples t-test calculation was not significant - ($t(606) = 0.364$, $p > .05$) (Cronk, 2012).

A One-Way Analysis of Variance (ANOVA) test is useful to examine variability among means of two or more groups. This test requires one independent variable – in this case the JE scale score. The one-way Analysis of Variance test was calculated for the metropolitan, large rural, small rural and isolated rural RUCA zip code areas and JE Scale score. No significance difference was found. The four areas (metropolitan, large rural, small rural, and isolated rural) did not differ significantly regarding the JE scale score (see Table 17). Partial eta squared effect size calculations were also not significant (Cronk, 2012).

Table 17

ANOVA Summary for Metropolitan, Large Rural, Small Rural, and Isolated populations and JE Scale Score

	Sum of Squares	df	Mean Square	F	Sig.	η_p^2
Between Groups	.183	3	0.061	0.231	0.875*	.001
Within Groups	158.811	604	0.263			
Total	158.993	607				

Note: *p <0.05. Metropolitan = RUCA zip code areas 1-3), Large Rural =RUCA zip code areas 4-6.1, Small rural= RUCA zip code areas 7-9.2, and Isolated = RUCA zip code areas 10-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

A one-way Analysis of Variance test was also calculated for the three rural RUCA zip code areas (large rural, small rural, and isolated rural) and JE Scale score. No significance difference was found. The three areas (large rural, small rural, and isolated rural) did not differ significantly regarding the JE scale score (see Table 18). Partial eta squared effect size calculations were also not significant (Cronk, 2012).

Table 18

ANOVA Summary for, Large Rural, Small Rural, and Isolated populations and JE Scale Score

	Sum of Squares	df	Mean Square	F	Sig.	η_p^2
Between Groups	0.148	2	0.074	0.292	0.747*	0.003
Within Groups	50.027	198	0.253			
Total	50.174	200				

Note: *p <0.05. Large Rural =RUCA zip code areas 4-6.1, Small rural= RUCA zip code areas 7-9.2, and Isolated = RUCA zip code areas 10-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Aim 3

Specific Aim 3. What are the JE characteristics of highly embedded nurses working in NC-SCA?

Assumption 3. Community fit and community sacrifice embeddedness scores will be high in nurses working in NC-SCA with high total *Job Embeddedness Scale* scores.

Job Embeddedness Scale z-scores in the top 25% of the total population consists of total JE scale z-scores greater than .3558. *Job Embeddedness Scale* scores higher than this number (.3558) were used to identify "highly embedded" nurses. A new variable consisting of this population was created to compute this information.

Means of the six JE dimensions for the highly embedded nurses in the total study population are found in Table 19. The means for these dimensions are expressed as z-scores and after rounding are closer to 1 than zero which is above the mean (Cronk, 2012). Fit-Community and Sacrifice-Community JE z-scores were above zero and higher than those of the total population which supports the assumption. However, in this highly embedded population, Sacrifice-Organization and Sacrifice-Community were actually the first and second highest ranked JE dimensions. A Pearson correlation coefficient was calculated for the relationship between Job Embeddedness and each individual JE dimensions in the highly embedded nurse population. All six dimensions were significant at the 0.001 level with weak (less than 0.3) or moderately (0.3-0.7) positive correlations (Cronk, 2012).

Table 19

Highly Embedded NC-SCA nurses in RUCA Zip Code Categories 1-10.6-JE Dimension Z-score and Pearson Correlation Results

Dimension	*Mean*	*Rank*	*Pearson Correlation*	*R*	*Sig. (2 tailed)**
Sacrifice-Community	0.6847	2	0.299 (weak)	196	0.01
Sacrifice-Organization	0.7158	1	0.529 (moderate)	194	0.01
Links-Community	0.3943	6	0.338 (moderate)	195	0.01
Links-Organization	0.3912	5	0.436 (moderate)	196	0.01
Fit-Community	0.5886	4	0.294 (weak)	202	0.01
Fit-Organization	0.6684	3	0.428 (moderate)	199	0.01
Total JE Scale Score	0.5769				

Note. *p<.05.

Table 20 delves deeper into the JE sub-dimension characteristics of the RUCA zip code categories and provides additional insight into this population. Only the small rural area NC-SCA nurses reported Links as the two highest JE Scale score means. Sacrifice-Community appears three times, Sacrifice-Organization appears four times and Fit-Organization appears three times on the table.

Table 20

Two Highest JE Dimensions and Sub-Dimensions for Highly Embedded Nurses Categories

Population	JE Scale Score	Top 2 JE Dimensions	Top Sub-Dimension
Total Study			
Population	0.5769	Sacrifice-Organization	Outstanding Perks
		Sacrifice-Community	Respected in the community
Metropolitan	0.5808	Sacrifice-Organization	Outstanding Perks
		Fit-Organization	Can reach professional goals
Large Rural	0.5890	Sacrifice-Community	Leaving community would be hard
		Sacrifice-Organization	Leaving job would be a sacrifice
Small Rural	0.5967	Links-Community	Close friends nearby
		Links-Organization	Work team participation
Isolated	0.5946	Sacrifice-Organization	Good Benefits
		Fit-Organization	Fit with company culture
Rural	0.5930	Fit-Organization	Likes level of responsibility
		Sacrifice-Community	Respected in the community

Note: Total study population= RUCA zip code areas 1-10.6. Metropolitan = RUCA zip code areas 1-3), Large Rural =RUCA zip code areas 4-6.1, Small rural= RUCA zip code areas 7-9.2, Isolated = RUCA zip code areas 10-10.6, and Rural=RUCA zip code areas 4-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Aim 4

Specific Aim 4. Is intent to leave predictive of low levels of job embeddedness for nurses working in NC-SCA?

Assumption 4. Intent to leave will be predictive of low JE levels in nurses working in rural areas (those with a RUCA work zip code category 4-10.6).

Multiple linear regression calculations were performed for this question. Assumptions associated with this include that the dependent variable is at the interval or ratio level (– z-scores are interval-type data and assume a normal distribution). The independent variables may be nominal, ordinal, interval, or ratio (Laerd Statistics, 2017). The variables of age, history of rural education, history of living in a rural area, job title, intent to leave, distance to workplace from home, intent to stay, work commute distance, work commute time in minutes, work address zip code, home zip code, and educational level meet these assumptions and were entered into SPSS. The multiple linear regression calculation was significant that intent to stay was predictive of JE score in nurses working in NC-SCA (RUCA work zip codes 1-10.6). Education level, years on the job, history of living in a rural area, and work drive time were also significant. For comparison, multiple linear regression calculations for metropolitan, rural, whole study population, nurses with high levels of embeddedness, and nurses with low levels are presented in Table 21.

Table 21

Multiple Regression Analysis of Demographic Data on Job Embeddedness Scale Score by RUCA zip code categories and level of embeddedness

RUCA Category	Metro	Lg.Rural	Sm.Rural	Isolated	All Rural	Total Study Population	HE	LE
R^2	0.182	0.350	0.349	0.358	0.264	0.185	0.096	0.094
Df	13,319	13,43	13,22	13,52	13,145	13,478	13,114	13,99
F	5.460	1.777	0.907	2.231	4.000	8.369	1.023	0.792
MR	0.000*	0.079	0.560	0.021*	0.000*	0.000*	0.435	0.667
Work zip	0.890	0.607	0.934	0.713	0.140	0.351	0 .827	0.068
Title	0.745	0.896	0.925	0.485	0.435	0.881	0.427	0.380
Ed level	0.058	0.057	0.284	0.134	0.006*	0.0032*	0.047*	0.621
Years at job	0.000*	0.062	0.215	0.037*	0.000*	0.000*	0.087	0.832
Rural living	0.004*	0.999	0.375	0.046*	0.243	0.002*	0.661	0.321
Rural education	0.542	0.216	0.199	0.563	0.576	0.888	0.976	0.621
Age	0.975	0.747	0.243	0.236	0.259	0.591	0.835	0.914
Intent to stay	0.004*	0.784	0.258	0.872	0.555	0.009*	0.552	0.163
Intent to leave.	0.891	0.480	0.333	0.236	0.267	0.498	0.873	0.170
Home zip	0.827	0.635	0.344	0.530	0.209	0.418	0.550	0.073
Work drive	0.249	0.189	0.678	0.195	0.018*	0.0010*	0.200	0.963
Commute time	0.472	0 .109	0.856	0.139	0.007*	0.014*	0.368	0.603

Note: *=significant p<0.5. R=multiple regression significance. Metropolitan = RUCA zip code areas 1-3. Lg. Rural =Large rural - RUCA zip code areas 4-6.1. Sm. Rural = Small Rural RUCA zip code areas 7-9.2. Isolated = RUCA zip code areas 10-10.6 (isolated small rural areas). All Rural = RUCA zip code categories 4-10.6. Total Study= RUCA zip code categories 1-10.6. HE= nurses with high level of embeddedness from RUCA zip code categories 1-10.6. LE= nurses with low level of embeddedness from RUCA zip code categories 1-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

The multiple linear regression calculation was not significant that intent to leave was predictive of low JE score in nurses working in rural areas (RUCA zip code category 4-10.6). The assumption is not supported. When the remaining individual RUCA zip code categories multiple regression results were examined, intent to stay was not also predictive of Job Embeddedness for the RUCA zip code categories of large rural, small rural, isolated, nurses with high JE scores, and nurses with low JE scale scores. There were no significant coefficients in any of these groups as well– see Table 22.

Table 22

Low Embeddedness-Multiple Regression Analysis of Demographics and JE Scale score on "Job Embeddedness"

RUCA	Metropolitan	Lg. Rural	Sm. Rural	Isolated Rural	Total Rural
R^2	0.047	0.992	0.980	0.938	0.463
Df	11,68	11,1	6,1	10,1	11,21
F	0.304	10.878	8.004	1.524	1.648
MR Sig	0.983	0.233	0.264	0.563	0.156

Note: *=significant p<05. MR=multiple regression significance. Metropolitan = RUCA zip code areas 1-3, Large rural =RUCA code areas 4-6.1, Small rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. Total Rural = RUCA zip code categories 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Since intent to leave was not significant to predict JE Scale score in the rural populations of nurses with low levels of JE, additional calculations were completed. Intent to stay is often seen as the dependent variable in studies using the JE scale (Reitz et al., 2010). In order to compare this study population to other study populations, multiple linear regression calculations were done by exchanging JE for Intent to stay as the dependent variable and moving JE to the independent variables position along with work zip code, title, education level, years at present job, a history of rural living, a history of receiving nursing education in rural settings, age, intent to leave their current job, home zip code, work drive in miles driven, and work drive time in minutes. The multiple linear regression results were significant that intent to leave consistently

predicted intent to stay across several of the study populations (see Table 23). JE Scale score was not consistent to predict intent to stay.

Table 23

Multiple Regression Analysis of Demographic Data on Job Embeddedness Scale Score by RUCA zip code categories and Intent to Stay

RUCA	Metropolitan	All LE	LE Rural	All HE	All Rural	Total Study Population
R^2	0.746	0.788	0.839	0.621	0.763	0.739
Df	12,320	12,100	12.20	12.115	12.146	12, 479
F	78.136	30.917	8.683	15.680	39.199	112.978
MR	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Work Zip	0.702	0.181	0.368	0.735	0.140	0.530
Title	0.060	0.343	0.044*	0.453	0.306	0.388
Ed. Level	0.362	0.139	0.211	0.629	0.280	0.313
Years at Job	0.781	0.322	0.227	0.404	0.290	0.652
Rural Living	0.441	0.116	0.070	0.374	0.278	0.900
Rural Education	0.436	0.181	0.058	0.549	0.004*	0.369
Age	0.350	0.229	0.771	0.357	0.050*	0.060
Intent to leave	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Home zip	0.597	0.184	0.437	0.529	0.045*	0.538
Work Drive	0.840	0.728	0.419	0.668	0.046*	0.710
Commute time	0.867	0.879	0.479	0.793	0.112	0.848
JE Score	0.004*	0.169	0.098	0.485	0.524	0.008*

Note: *p<.001. Metropolitan = RUCA zip code categoryies1-3. All LE – Nurses with low levels of JE from RUCA zip code categories 1-10.6. LE Rural= Nurses with low levels of JE from RUCA zip code categories 4-10.6. All HE= Nurses with high levels of JE from RUCA zip code categories 1-10.6. All Rural= RUCA zip code categories 4-10.6. Total study population = RUCA 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Tables 24 and 25 provide demographic data for those NC-SCA nurses with low JE scale scores. This is done to provide a richer description of this population. As with the total study population and highly embedded study population, this group is made up of primarily registered nurses with Associate or Baccalaureate degrees.

Table 24

Low levels of Embeddedness - Metropolitan, Rural, and Total Study Population - NC-SCA Nurses Education Level

RUCA	Metropolitan	Rural	Total Study Population
Ed Level N=	104	50	151
Certificate	8(7.7%)	3(6%)	11(7.2%)
ADN	26(25%)	19(38%)	45(29.8%)
BSN	43(41.3%)	17(34%)	60(39.5%)
MSN	20(19.2%)	11(22%)	31(20.5%)
PhD	0	0	0
DNP	3(2.9%)	0	3(2%)
Other Ed	1(.96%)	0	1

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

Table 25 contains work titles of the nurses with low levels of JE embeddedness. As in the other populations, registered nurses predominate.

Table 25

Metropolitan, Rural, and Total Study Population - Low Levels of Embeddedness- NC-SCA Nurses Title

RUCA	Metropolitan	Rural	Total Study Population
N=	102	50	151
LPN	9(8.8%)	7(14%)	16 (10.5%)
RN	81(79.4%)	36(72%)	117 (77%)
NP	10(9.8%)	3(6%)	13(8.6%)
CNM	0	1(2%)	1 (.7%)
CNS	0	0	0
CRNA	1(.98%)	3(6%)	4 (2.6%)

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

The education level of those study participants with low levels of embeddedness from rural areas is displayed in Table 26.

Table 26

Rural Only- Low Levels of Embeddedness- NC-SCA Nurses Education Level

RUCA	Large Rural	Small Rural	Isolated	Rural
Ed Level N=	20	12	18	50
Certificate	2(10%)	1(8.3%)	0	3(6%)
ADN	9(45%)	2(16.7%)	8(44.4%)	19(38%)
BSN	6(30%)	4(33.3%)	7(38.9%)	17(34%)
MSN	3(15%)	5(41.7%)	3(16.7%)	11(22%)
PhD	0	0	0	0
DNP	0	0	0	0
Other Ed	0	0	0	0

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016. ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

Table 27 contains work title data from the rural RUCA zip code categories. Registered nurses were also the most numerous in these areas.

Table 27

Rural Only - Low Levels of Embeddedness- NC-SCA Nurses Title

RUCA	Large Rural	Small Rural	Isolated	Rural
N=	20	12	18	50
LPN	5(25%)	1(8.3%)	1(5.6%)	7(14%)
RN	13(65%)	8(66.7%)	15(83.3%)	36(72%)
NP	1(5%)	0	2(11.1%)	3(6%)
CNM	1(5%)	0	0	1(2%)
CNS	0	0	0	0
CRNA	0	3(25%)	0	3(6%)

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016. LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

Table 28 contains demographic data expressed in means for those participants with low levels of embeddedness. The years in current position are lower in this group of participants when compared to the study population as a whole.

Table 28

Metropolitan and Rural - Low Levels of Embeddedness- NC-SCA Nurses Demographic Data (Means)

RUCA	Metropolitan	Rural	Total Study Population
Years in Current Position	6.16(7.9sd) N=98	6.75(7.1sd) n=44	6.35(7.7sd) N=143
Age	45.97(14.9sd) N=91	46.52(13.39sd) n=42	46.14(12.2sd) N=133
Miles to Work	14.45(12.7sd) N=97	15.49(13.03sd) N=43	14.77(12.5sd) N=140
Drive time In minutes	21.68(14.9sd) N=95	23.04(16.83sd) n=47	22.13(15.5sd)) N=142

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. Sd=Standard deviation.

Additional demographic data for nurses with low levels of embeddedness are found in Table 29. Intent to stay is lower and intent to leave is higher in this population when compared to the total study population.

Table 29

Metropolitan and Rural - Low Levels of Embeddedness- NC-SCA Nurses Additional Demographic Data

RUCA	Metropolitan	Rural	Total Study Population
History of Living in Rural Area	65 (65%) N=100	46 (92%) N=50	111 (74%) N=150
History of Rural Education	47 (46.5%) N=101)	30 (60%) N=50	77 (51%) N=151
Intent to stay- Yes	66 (64.7%) N=102	26 (53.1%) N=49	92 (70.9%) N=151
Intent to stay- No	36 (35%) N=102	23 (46.9%) N=49	59 (39.1%) N=151
Intent to Leave- Yes	38 (37.6%) N=101	23 (48.9%) N=47	61 (40.4%) N=151
Intent to leave- No	59 (58.4%) N=101	24 (51.1%) N=47	83 (54.6%) N=151
Most common Home Zip (mode)	1 N=102	Lg/sm rural(tie) N=49	1 N=151

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6.

Demographic data expressed in means for the nurses working in rural areas is found in Table 30. This population is slightly younger than the total study population, but still remains in the 40 and over age group. Work commute is not very different than the total study population. The small rural population of nurses with low levels of embeddedness was the lowest of any group discussed in this study.

Table 30

Rural Only - Low Levels of Embeddedness- NC-SCA Nurses Demographic Data (Means)

RUCA	Large Rural	Small Rural	Isolated	Rural
Years in Current Position	7.88(6.8sd) N= 17	3.33(3.2sd) N=9	7.39(8.6sd) N=18	6.75(7.1sd) N=44
Age	46.22(11.0sd) N=18	40.70(8.7sd)) N=10	51.07(12.6sd) N=14	46.52(11.50sd) N=42
Miles to Work	15.28(13.5sd) N=18	14.33(10.9sd) N=9	16.38(14.3sd) N=16	15.49(13.03sd)) N=43
Drive time In minutes	25.00(17.0sd) N=19	18.09(10.1) N=11	24.06(17.9) N=17	23.04(16.83sd) N=47

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6) (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016.

Table 31 has additional demographic data for nurses with low levels of JE. As with the total study population, most nurses have a history of living in a rural area and having a history of receiving at least a portion of their nursing education in rural areas.

Table 31

Rural Only - Low Levels of Embeddedness- NC-SCA Nurses Additional Demographic Data

RUCA	Large Rural	Small Rural	Isolated	All Rural
History of Living in Rural Area	19(95%) N=20	11(91.7%) N=12	16(88.9%) N=18	46(92%) N=50
History of Rural Education	13(65%) N=20	8(66.7%) N=12	9(50%) N=18	30(60%) N=50
Intent to stay-Yes	11(55%) N=20	4(33.3%) N=12	11(64.7%) N=17	26(53%) N=49
Intent to stay-No	9(45%) N=20	8(66.7%) N=12	6(35%) N=17	23(46.9%) N=49
Intent to Leave-Yes	9(50%) N=18	7(58.3%) N=12	7(41.2%) N=17	23(48.9%) N=47
Intent to leave-No	9(50%) N=18	5(41.7%) N=12	10(58.8%) N=17	24(51%) N=47
Most common Home Zip(mode)	Lg. Rural N=20	Small rural N=12	Isolated4 N=19	Lg/sm rural (tie) N=49

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. All Rural=4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016.

JE Scale score and dimension scores for the whole study population of nurses with low levels of embeddedness are displayed in Table 32.

Table 32

Whole Study Population-JE Scale Z-score Results from Low Levels of Embeddedness*

Dimension	N	Minimum	Maximum	Mean	Standard Deviation
Sacrifice-Community	143	-3.45	.97	-0.8504	0.74985
Sacrifice-Organization	142	-2.13	.80	-0.7814	0.62188
Links-Community	144	-1.58	1.03	-0.3998	0.61359
Links-Organization	144	-1.83	.78	0.3897	0.49660
Fit-Community	152	-3.35	0.79	-0.8358	0.92353
Fit-Organization	150	-2.89	.80	-0.8496	0.82602
Total JE Scale Score	152	-2.11	.33	-0.6965	0.34306

Note. *=RUCA code areas 1-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

The metropolitan nurse JE Scale z-scores for those with low levels of embeddedness are noted in Table 33. All but one dimension has a negative mean.

Table 33

Metropolitan Population-JE Scale Z-score Results from Low Levels of Embeddedness*

Dimension	N	Minimum	Maximum	Mean	Standard Deviation
Sacrifice-Community	95	-3.45	0.97	-0.9900	0.74510
Sacrifice-Organization	94	-2.13	0.80	0.6517	0.61104
Links-Community	96	-1.58	0.89	-0.4865	0.61332
Links-Organization	96	-1.83	0.78	-0.4007	0.51580
Fit-Community	102	-3.35	0.79	-0.8138	0.96480
Fit-Organization	101	-2.89	0.80	-0.8177	0.83308
Total JE Scale Score	102	-2.00	-0.33	-0.6968	0.35393

Note. *=RUCA code areas 1-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Two-dimension means are positive in the rural population of NC-SCA nurses with low JE scale scores (see Table 34).

Table 34

All Rural Population-JE Dimension Z-score Results from Low Levels of Embeddedness*

Dimension	N	Minimum	Maximum	Mean	Standard Deviation
Sacrifice-Community	48	-2.11	0.97	-0.5741	0.68635
Sacrifice-Organization	48	-2.04	0.37	-1.0354	0.56734
Links-Community	48	-1.42	1.03	-0.2263	0.58230
Links-Organization	48	-1.53	0.66	0.3678	0.46024
Fit-Community	50	-2.94	0.61	-0.8808	0.81582
Fit-Organization	49	-2.56	0.77	0.9154	0.81582
Total JE Scale Score	50	-2.11	-.33	-0.6961	0.32323

Note. *=RUCA code areas 1-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Table 35 contains specific JE information regarding each RUCA zip code category for nurses with low JE along with the lowest two dimension and sub-dimension information.

Table 35

Low Levels of Embeddedness - Two Lowest JE Dimensions and Sub-Dimension

Population	JE Scale Score	Lowest 2 JE Dimensions	Lowest Sub-Dimension
Whole Population	-0.6965	Fit-Organization	Not a good match
		Sacrifice-Community	Not hard to leave community
Metropolitan	-0.6968	Fit-Organization	Not a good match
		Sacrifice-Community	Neighborhood is not safe
Large rural	-0.6468	Fit-Community	Community not a good match
		Sacrifice-Organization	Not a sacrifice to leave
Small Rural	-0.7106	Fit-Organization	Not a good match
		Sacrifice-organization	Poor prospects for future work
Isolated	-0.7106	Sacrifice-Organization	Poor prospects for future work
		Fit-Organization	Not a good match
Rural	-0.6961	Fit-Organization	Cannot reach professional goals
		Sacrifice-Organization	Poor prospects for future work

Note: Metropolitan = RUCA code areas 1-3, Large Rural =RUCA code areas 4-6.1, Small rural= RUCA code areas 7-9.2, Isolated = RUCA code areas 10-10.6, and Rural=RUCA code areas 4-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Aim 5

Specific Aim 5. What factors predict job embeddedness scores for nurses working in NC-SCA?

Assumption 5. Highly embedded nurses working in rural areas will have strong ties to the community defined by having a history of living in a rural area or will have had rural educational experiences.

Multiple linear regression allows prediction and assumes variables are at the interval or ratio level and the variables are normally distributed - see Table 36 (Cronk, 2012). Overall, several demographic factors were statistically significant to predict JE scores in the total NC-SCA population of nurses working in Appalachian worksites (RUCA zip code categories 1-10.6). Education level, intent to stay, history of living in a rural area, years working in current position, miles driven to work, and work commute time had p values less than .05. The multiple regression calculations were significant (Cronk, 2012).Significant results from the multiple linear regression for nurses working in metropolitan areas (RUCA zip code category 1) reveal years on the job, a history of rural living, and intent to stay predicts the JE scale score. The multiple linear regression results for RUCA zip code categories large rural, small rural, and highly embedded nurses and nurses with low JE scale scores were not significant (see Table 36). For nurses working in isolated rural areas, the multiple linear regression revealed years on the job and a history of rural living were significant to predict JE scale scores (see Table 36). Education level, years on the job, and work commute factors were significant in the multiple linear regression for nurses working in rural (RUCA zip code category areas 4-10.6) although a history of living in a rural area and history of receiving nursing education in a rural area was not significant.

Table 36

Multiple Regression Analysis of Demographic Data on Job Embeddedness Scale Score by RUCA zip code categories and level of embeddedness

RUCA Category	Metro	Lg.Rural	Sm.Rural	Isolated	All Rural	Total Study Population	HE	LE
R^2	0.182	0.350	0.349	0.358	0.264	0.185	0.096	0.094
Df	13,319	13,43	13,22	13,52	13,145	13,478	13,114	13,99
F	5.460	1.777	0.907	2.231	4.000	8.369	1.023	0.792
MR	0.000*	0.079	0.560	0.021*	0.000*	0.000*	0.435	0.667
Work zip	0.890	0.607	0.934	0.713	0.140	0.351	0 .827	0.068
Title	0.745	0.896	0.925	0.485	0.435	0.881	0.427	0.380
Ed level	0.058	0.057	0.284	0.134	0.006*	0.0032*	0.047*	0.621
Years at job	0.000*	0.062	0.215	0.037*	0.000*	0.000*	0.087	0.832
Rural living	0.004*	0.999	0.375	0.046*	0.243	0.002*	0.661	0.321
Rural education	0.542	0.216	0.199	0.563	0.576	0.888	0.976	0.621
Age	0.975	0.747	0.243	0.236	0.259	0.591	0.835	0.914
Intent to stay	0.004*	0.784	0.258	0.872	0.555	0.009*	0.552	0.163
Intent to leave.	0.891	0.480	0.333	0.236	0.267	0.498	0.873	0.170
Home zip	0.827	0.635	0.344	0.530	0.209	0.418	0.550	0.073
Work drive	0.249	0.189	0.678	0.195	0.018*	0.0010*	0.200	0.963
Commute time	0.472	0.109	0.856	0.139	0.007*	0.014*	0.368	0.603

Note: *=significant p<0.5. R=multiple regression significance. Metropolitan = RUCA zip code areas 1-3. Lg. Rural =Large rural - RUCA zip code areas 4-6.1. Sm. Rural = Small Rural RUCA zip code areas 7-9.2. Isolated = RUCA zip code areas 10-10.6 (isolated small rural areas). All Rural = RUCA zip code categories 4-10.6. Total Study= RUCA zip code categories 1-10.6. HE= nurses with high level of embeddedness from RUCA zip code categories 1-10.6. LE= nurses with low level of embeddedness from RUCA zip code categories 1-10.6. (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016).

Having a history of living in a rural area was common for highly embedded nurses from rural areas (96%). Seventy-seven percent reported receiving all or part of their nursing education in a rural area. Therefore, highly embedded nurses working in rural areas had strong ties to the community defined by having a history of living in a rural area having had rural educational experiences and this supports the assumption (see table 37). However, the multiple linear regression calculation for this population was not significant that a history of rural living or receiving all or part of their education in a rural area predicted JE in highly embedded nurses.

Table 37

Rural only- Highly Embedded NC-SCA Nurses Additional Demographic Data by RUCA Zip Code Category

RUCA	Lg. Rural	Sm. Rural	Isolated	All Rural
History of Living in Rural Area-Yes	15 100% N=15	7 88% N=8	20 95.2% N=21	42 95.5 N=42
History of Rural Education	12 80%	5 63%	17 81%	34 77%
Education	N=15	N=8	N=21	N=44
Intent to stay-Yes	14 93% N=15	7 88% N=8	18 86% N=21	39 89% N=44
Intent to stay-No	1 6.7% N=15	1 12.5% N=8	3 14% N=21	5 11.4% N=44
Intent to Leave-Yes	1 6.7% N=15	2 25% N=8	3 14% N=21	6 13.6% N=44
Intent to leave-No	14 93.3% N=15	6 75% N=8	18 86% N=21	38 86.4% N=44
Home Zip (RUCA Category mode)	Lg. Rural N=15	Sm. Rural N=8	Isolated N=21	Isolated N=44

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. All Rural=4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016.

Additional demographic results follow in order to provide a richer description of nurses with high JE scale scores in NC-SCA. Table 38 contains work title information for the highly embedded NC-SCA nurses. Registered nurses predominate this group as well as the study population as a whole.

Table 38

Highly Embedded NC-SCA Nurses Title by RUCA Address Zip Code Category

RUCA	Metropolitan	Rural	Total Study Population
Title N=	106	43	149
LPN	4(3.7%)	4(9.3%)	8(5.4%)
RN	87(82%)	35(82.4%)	122(81.8%)
NP	9(8.5%)	3(7.0%)	12(8.1%)
CNM	0	0	0
CNS	3(2.8%)	0	3(2.0%)
CRNA	3(2.8%)	1(2.3%)	4(2.7%)

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

Study participants working in rural areas with high levels of embeddedness are also predominantly registered nurses (see Table 39).

Table 39

Rural only - Highly Embedded NC-SCA Nurses Title

RUCA	Large Rural	Small Rural	Isolated	All rural
Title N=	15	8	21	43
LPN	0	1(12.5%)	3(14%)	4(9.3%)
RN	14(93.3%)	6(75%)	16((76%)	35(82.4%)
NP	1(6.7%)	0	2(9.5%)	3(7.0%)
CNM	0	0	0	0
CNS	0	0	0	0
CRNA	0	1(12.5%)	0	1(2.3%)

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. All Rural=4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016. LPN=Licensed Practical Nurse, RN=Registered Nurse, NP=Nurse Practitioner, CNM=Certified nurse midwife, CNS=Clinical Nurse Specialist, and CRNA= Certified Registered Nurse Anesthetist.

Table 40 contains the highest degree obtained by the "highly embedded" study participants.

Table 40

Highly Embedded NC-SCA Nurses Education Level

RUCA	Metropolitan	Rural	Whole Study Population
N=	107	43	150
Certificate	4(3.7%)	5(11.6%)	9(6%)
ADN	28(26%)	7(16%)	35(23%)
BSN	39(36%)	16(37%)	55(37%)
MSN	31(30%)	11(26%)	42(28%)
PhD	2(1.9%)	1(2.3%)	3(2%)
DNP	3(2.8%)	1(2.3%)	4(2.7%)
Other Ed	0	2(4.7%)	2(1.3%)

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

Baccalaureate degree prepared nurses comprise the majority of the population of nurses with high levels of embeddedness in rural areas (see Table 41).

Table 41

Rural only - Highly Embedded NC-SCA Nurses Education Level

RUCA	Large rural	Small rural	Isolated rural	Rural
N=	15	8	21	43
Certificate	1(6.7%)	1(12.5%)	3(14%)	5(11.6%)
ADN	3(20%)	0	4(19%)	7(16%)
BSN	4(26.7%)	3(37.5%)	9(43%)	16(37%)
MSN	7(46.7%)	2(25%)	3(14%)	11(26%)
PhD	0	0	1(5%)	1(2.3%)
DNP	0	0	1(5%)	1(2.3%)
Other Ed	0	2(25%)	0	2(4.7%)

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. All Rural=4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016. ADN=Associate Degree in Nursing. BSN=Baccalaureate Degree in Nursing, MSN=Master's Degree in Nursing. PhD= Doctor of Philosophy in Nursing. DNP=Doctor of Nursing Practice. Other Ed= Any other earned degree.

The population of NC-SCA nurses are a bit older and have working in their current position longer than the study population as a whole (see Table 42).

Table 42

Highly Embedded NC-SCA Nurses Demographic Data Expressed In Means

RUCA	Metropolitan	All Rural	Total Study Population
Years in Current Position	12.58(9.66 sd) N=106	10.60(9.49 sd) N=42	12.01(9.6 sd) N=148
Age	48.97(10.18sd) N=96	51.32(8.49sd) N=41	49.67(9.85 sd) N=137
Miles to Work	15.59 (11.34 sd) N=107	17.34(16.60 sd) N=41	16.07(12.99 sd) N=148
Drive time In minutes	22.10 (13.74 sd) N=107	21.79(18.62 sd) N=39	22.02(15.13 sd) N=146

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6. SD=standard deviation.

The nurses working in rural areas with high levels of embeddedness overall have longer work commutes than those in the total study population (see Table 43).

Table 43

Rural only - Highly Embedded NC-SCA Nurses Demographic Data expressed in means

RUCA	Large Rural	Small Rural	Isolated	All Rural
Years in Current Position	11.07(8.96 sd) N=14	8.38(7.82 sd) N=8	11.15(10.70 sd) N=20	10.60(9.49 sd) N=42
Age	49(9.22 sd) N=14	49.14(10.11 sd) N=7	53.70(8.14 sd) N=20	50.10(11.86 sd) N=42
Miles to Work	20.43(19.13 sd) N=14	21.13(24.14 sd) N=8	13.47(9.58 sd) N=20	17.34(16.60 sd) N=41
Drive time In minutes	24.58(19.24 sd) N=14	26.88(27.38 sd) N=8	17.89(13.47 sd) N=20	21.79(18,62 sd) N=39

Note: Large Rural =RUCA code areas 4-6.1, Small Rural = RUCA code areas 7-9.2, and Isolated = RUCA code areas 10-10.6. All Rural=4-10.6 (Washington, Wyoming, Alaska, Montana, and Idaho Rural Health Research Center, 2016. Sd=standard deviation.

As would be expected, intent to stay is high, and intent to leave is low in nurses with high levels of embeddedness (Table 44).

Table 44

Highly Embedded NC-SCA Nurses Additional Demographic Data by RUCA Zip Code Category

RUCA	Metropolitan	Rural	Total Study Population
History of Living in Rural Area-yes	81 75% N=108	42 95.5% N=43	123 81% N=151
History of Rural Education	52 48% N=108	34 77% N=44	86 57% N=152
Intent to stay-Yes	99 92% N=107	39 89% N=44	138 91% N=149
Intent to stay-No	8 7.5% N=107	5 11.4% N=44	13 8.6% N=149
Intent to Leave-Yes	14 13% N=108	6 13.6% N=44	20 13% N=152
Intent to leave-No	94 87% N=108	38 86.4%% N=44	132 87% N=152
Home Zip (RUCA Category mode)	Metropolitan N=108	Isolated N=44	Metropolitan N=149

Note: Metropolitan = RUCA code areas 1-3 (metropolitan areas), Rural =RUCA code areas 4-10.6. Total study population=RUCA code areas 1-10.6.

Additional Comments

Additional comments provided at the end of the survey for the most part consisted of wishing the researcher good luck with the study or explaining their work situation. Positive comments included loving the area where they live and work, having family near, having flexible schedules, and feeling like their work is valuable as factors that keep them working in their current position. Negative comments included being constrained by limited opportunities, lack of job security, having had benefits reduced, not feeling valued or respected, feeling overworked, or were bored as reasons they were not happy with their current position. A full qualitative analysis of these comments went beyond the scope and purpose of this study.

Reliability and Validity

Cronbach alpha results of the *Job Embeddedness Scale* for this study and the original 2001 study by Mitchell et al. (2001) are found in Table 45. The overall alpha of both this study and the original instrument are around 0.90 and represent good internal consistency. Cronbach alpha results closer to 1.00 are considered good (Cronk, 2012).

Table 45

Cronbach alpha results

Dimension	Present study	Original study*
Overall alpha	0.928	0.87
Fit-Community	0.889	0.79
Fit-Organization	0.927	0.86
Links-Community	0.501	0.50
Links-Organization	0.689	0.62
Sacrifice-Community	0.643	0.59
Sacrifice-Organization	0.917	0.82

Note: *Results from hospital employees. (Mitchell et al., 2001.)

Pearson correlation coefficients were calculated for JE score and intent to leave and JE score and intent to stay. Both calculations were significant. The Pearson correlation coefficient can be used to determine criterion-related validity. The negative relationship between JE score and intent to leave demonstrates that as JE goes up, intent to leave goes down. The positive relationship between intent to stay and JE score demonstrates that as JE score goes up, intent to stay goes up. These calculations represent the criterion-related validity coefficients in this study –see Table 46 (Cronk, 2012).

Table 46

Pearson's Correlation for JE Score and Intent to Leave/Stay

	R	Pearson Correlation	Significance
JE/Intent to Stay	791	.302	.000*
JE/Intent to Leave	791	-.293	.000*

Note: * = p<..01(2 tailed).

Summary

Analysis of the survey results were presented in this chapter. Although the sample population exceeded the amount indicated in the power analysis, the response rate was low. A majority of participants reported living and working in metropolitan areas. This was unexpected as the survey was targeting the Appalachian counties of North Carolina which paints a picture of rural topography and small town residents. The findings of the data analysis revealed a mixed bag of results regarding supporting or rejecting the five assumptions.

Assumption one was not supported. Job embeddedness in this population was just below the mean, which did not support the hypothesis that Job Embeddedness would be high (above the mean). However, according to results from the JE scale, participants reported a mean of working eight years in their current position with nearly 80% reporting intent to stay in their position for the next year.

Assumption two was supported. Nurses working in rural areas had lower JE scores than nurses working in metropolitan areas although the difference was not statistically significant.

Assumption three was supported. Nurses with high JE scores did report higher means of community fit and community sacrifice that the population as a whole. However, Sacrifice-

Organization and Sacrifice-Community were actually the first and second highest ranked JE dimensions in this population.

Assumption four was not supported. Linear regression calculations did not reveal that intent to leave was predictive of a low JE score in nurses working in rural areas. Education level, years on the job, and work commute factors were significant in this population to predict JE scale score. Intent to leave was significant to predict intent to stay in this population.

Assumption five was supported. Although a linear regression to predict that highly embedded nurses would have a history of living in a rural area or a history of rural education experiences was not significant, a large portion of the survey participants did report a history of these experiences. Further discussion of these findings will continue in Chapter 5.

CHAPTER 5

DISCUSSION

Understanding what keeps the nurses of NC-SCA on the job is beneficial to nurses, health care organizations, and patients. The purpose of this study was to assess the job embeddedness level of nurses working in NC-SCA in order to offer guidance regarding retention of nurses working in this area. Data analysis of the information collected in this study provided insight into the level of job embeddedness in this population along with the embeddedness characteristics of nurses working in this area – both those who were highly embedded, had low levels of embeddedness as well as the study population as a whole. A discussion of the specific aims and assumptions comprises the subject matter of this chapter.

Specific Aims and Assumptions

Aim 1

Aim 1. What is the Job Embeddedness (JE) score of nurses in NC-SCA as measured by the Mitchell et al, (2001) *Job Embeddedness Scale*?

Assumption 1. There will be high (above the mean) levels of job embeddedness in nurses working in NC-SCA.

The original intent of the authors of the *Job Embeddedness Scale* was to predict voluntary employee turnover (Lee, Burch, & Mitchell, 2014). Although job satisfaction, organizational commitment, and turnover are commonly studied concepts, employees stay on in jobs even when these concepts do not explain turnover rates. These authors believe that intent to stay was influenced by the six "dimensions" of fit, links, and sacrifice from community and organizational influences. This belief resulted in the *Job Embeddedness Scale* being created to measure these

influences and attempt to predict intent to stay (Mitchell et al., 2001). Although the reporting of the total JE score is not the focus of most studies on this topic, having a reference point to compare populations may prove useful. The data analysis for this study revealed a total JE score (reported as a z-score) to be -.0073. This score is slightly below the mean and therefore would not be considered high by the stated definition in Assumption 1. Job Embeddedness Theory notes that as the *Job Embeddedness Scale* scores go down, intent to leave goes up (Mitchell et al., 2001). Around 22% of nurses in the total study population (RUCA work zip code 1-10.6) stated intent to leave their position in the next year. Geographic differences exist with 26% of nurses working in rural areas and 20% nurses working in metropolitan areas planning on leaving their job in the next year. Nursing Solutions Incorporated (NSI) (NSI, 2017) conducts an annual survey of hospital RN turnover. For the 2017 report, 3900 invitations were sent across the country to hospitals and 38% of the 136 responses came from the Southeast. The most recent NSI report of hospital RN turnover in the southeastern United States revealed a rate of 16.5% and a national rate of 16.2%. A majority (89%) of the turnover was voluntary in nature – the nurses were not laid off or fired. The report also noted that only around 43% of the participating hospitals had formal retention strategies (NSI, 2017). This makes nurses working in NC-SCA reporting a potential turnover rate higher than the NSI report as a whole although this author's study population consists of nurses in all types of settings in a specific location and a true comparison is not possible. In the additional comments section of this author's study, several comments relayed frustration related to perceived lack of appreciation for nurses and lack of resources that inhibited job performance. These perceptions could influence intent to stay and *Job Embeddedness Scale* scores. Additionally, several comments related to intent to retire soon or lack of benefits as reasons for intent to leave.

Aim 2

Aim 2. Is there a difference in JE scale scores between nurses working in rural areas versus nurses working in urban areas in NC-SCA?

Assumption 2. The JE score in nurses working in rural areas will be lower than that of urban nurses.

This assumption was supported. The JE score of nurses working in rural areas (RUCA work zip code categories 4-10.6) was -.0180 and nurses working in metropolitan areas was -.0020. Of note, these numbers are both below the z-score mean of zero.

When looking at the separate JE dimension scores from the total study population of nurses working in NC-SCA (RUCA work zip code categories 1-10.6) revealed Fit-Organization and Sacrifice-organization as the two highest scoring dimensions. Having co-workers similar to themselves had the highest Fit-Organization mean and having excellent retirement benefits had the highest Sacrifice-Organization mean. Assessing if one is going to "fit in" a new organization begins with the interview for both the applicant and the employer. Halfer (2011) studied job embeddedness in nurses who had worked for a particular organization for one to three years suggested including staff nurses in the interview process as a means to assess if an applicant will "fit in". This practice would aid the applicant in discerning if their future co-workers are similar to themselves. Feeling well compensated and having a variety in job duties influenced intent to stay in a study of nurse practitioners in a family planning clinic (Cheng et al., 2014). Specifically discussing retirement benefits at an interview may be beneficial for this population of nurses. Employers can use this information to lobby for better benefit packages and encourage organizational fit.

The JE subscale dimensions of fit, links, and sacrifice can be visualized as strands in a web. Job Embeddedness Theory notes that "strands" are what hold people in place. The priority "strands" are unique to each workplace, therefore maximizing the strength of the strands should improve retention (Mitchell et al., 2001). Sacrifice-organization and Links-organization were the two highest means in the metropolitan population (RUCA zip code categories 1-3). Noting the top two subscale means land on the organizational side of the JE scale provides beneficial insight. Having good benefits had the highest mean in the Sacrifice-organization dimension and length of time in the industry had the highest mean in the Links-organization dimension. Having a sense of loyalty was tied to retention for nurses working in urban settings (Gambino, 2010). Length of time in the industry may be related to loyalty to nursing. Giving up good benefits could certainly be perceived as a sacrifice that would cause distress as described by Mitchell, et al., (2001).

JE scores from the rural subset (RUCA zip code categories 4-10.6) revealed that community factors- specifically Links-Community and Sacrifice-Community were the top two highest scoring dimensions. In particular, being a homeowner had the highest mean for the Links-Community dimension. The highest mean in the Sacrifice-Community was feeling respected in the community. Being considered an "insider" is a facet of Rural Nursing Theory and feeling respected along with having family roots and family members near may improve a nurse's image as someone who is an insider. However, this would reduce one's anonymity and could be perceived as a negative aspect over time. "Role diffusion" may be an issue due to these same factors – being known and respected in the community could result in the nurse being asked to wear many hats. Loss of anonymity and role diffusion are cited as a stress factors in Rural Theory (Long & Weinert, 2013).

The nurses working in the large rural RUCA zip code category had Sacrifice-Community and Links-Community as the top two JE sub-scale score means. Feeling like one fits in the community and having links in the community may reduce the feelings of being an outsider or improving one's image as an insider (Long & Weinert, 2013).

Fit-Community and Links-Community scored the highest two JE-sub-scale score means for nurses working in the small rural work zip category. Specifically, good weather and home ownership was important to this group. Enjoying one's community enough to buy a home may provide a "strand" strong enough to overcome less desirable job factors and keep one on the job.

The nurses working in the isolated areas reported Links-Community and Fit-Organization as the top two JE scale score means. Specifically, being a home owner and professional growth opportunities were important. Home ownership may be a factor that reduces being considered an outsider Having opportunities for professional growth can lead to confidence and perhaps counteract the stressor of role diffusion (Long & Weinert, 2013).

For the "highly embedded" nurses, two thirds of the JE sub-dimensions were organizational related. Understandably, the thought of experiencing the sacrifice of leaving a job that provides good benefits would influence JE. Also, the perception of having a job in which you feel like you fit in and where you can reach your professional goals would impact JE (Mitchell et al., 2011).

Nurses with low levels of embeddedness are at risk of leaving their current job. For this population, the lowest JE dimension and sub-dimensions were examined. More than half of the dimensions with low means were fit or organization related. Poor organizational fit manifests in this population as not being a good fit or not being able to reach professional goals. As

discussed earlier, the interview process is a good place to start examining fit – both for the applicant and the employer. Taking a job where one does not fit in is a waste of time and money for all involved (Halfer, 2011).

In summary, the JE scores of NC-SCA nurses have varied influences. The total study population and the metropolitan population each had Sacrifice-Organization as one of the highest two JE dimension means. The rural population had community related dimensions for the two highest JE means. Working to "play up" these dimensions in the workplace may improve nurse retention in NC-SCA.

Aim 3

Aim 3. What are the JE characteristics of highly embedded nurses working in NC-SCA?

Assumption 3. Community fit and community sacrifice embeddedness scores will be high in nurses working in NC-SCA with high total *Job Embeddedness Scale* scores.

In the highly embedded NC-SCA nurse population as a whole (RUCA zip code categories 1-10.6), Fit-Community and Sacrifice-Community JE z-scores were above zero and higher than those of the total population which supports the assumption. However, as noted previously in this highly embedded population, Sacrifice-Organization and Sacrifice-Community were actually the first and second highest ranked JE dimensions. Being respected in the community was the highest Sacrifice-Community sub-dimension mean and having outstanding perks on the job was the highest sub-dimension mean for Sacrifice-Organization. Sacrifice-community includes feeling respected in the community. Sacrifice-Organization includes freedom on the job, feeling respected on the job, having opportunities for promotion, being well compensated, and having good benefits. These characteristics are similar to characteristics that reduce turnover or improved retention in several studies (Baernholdt & Mark, 2009; Cheng et al.,

2014; Dotson et al., 2014). Improving social networking opportunities was cited as a method to improve retention by Hinson and Spatz (2011) and could increase community respect. Knowing that these dimensions are present in the highly embedded NC-SCA nurse population specifies areas employers can improve or maintain to improve retention. Attending to *Job Embeddedness Scale* score information was associated with cutting turnover in half in a study of rural hospitals (Stroth, 2010).

Aim 4

Specific Aim 4. Is intent to leave predictive of low levels of job embeddedness for nurses working in NC-SCA?

Assumption 4. Intent to leave will be predictive of low JE levels in nurses working in rural areas (RUCA code zip code categories 4-10.6).

Intent to leave was not a significant predictor of JE scale score in any population identified in this study regardless of level of embeddedness. In the nurses with low levels of embeddedness, the multiple regression calculations of each type of rural nurse group (metropolitan, large rural, small rural, isolated rural, and the all rural group) did not reveal any significant coefficients at all. Nurses working in rural (RUCA zip code categories 4-10.6) with low levels of embeddedness had less years on the job, were younger, had longer work commutes, less percentages of having a history of living in a rural area, or having received all or part of their education in rural areas than rural nurses in the total study population. Further investigation into this population of NC-SCA nurses is needed to fully understand factors that predict JE.

Previous studies JE studies involving nurses use intent to stay as the dependent variables in multiple regression calculations. Job title and intent to leave were significant to predict intent to stay in nurses working in rural areas (RUCA zip code categories 4-10.6) with low levels of

embeddedness. Using intent to stay as the dependent variable in multiple regression calculations in this population in the future would be useful.

In looking at variables associated with predicting JE in the rural nurse population as a whole, several findings provide increased understanding of this group. The percentage of nurses working in rural NC-SCA reporting intent to stay was lower than the whole study population as well as the metropolitan/urban population. The significant multiple regression factors influencing JE scale score for nurses from the whole study population working in rural areas (RUCA zip codes areas 4-10.6) include highest level of education, years on the job, and work commute factors. Other than years on the job, the percentage of these factors are not very different than the total study population or metropolitan work zip code categories study population. The rural (RUCA zip code categories 4-10.6) population had less years on the job than the other study participant groups. Halfer (2011), noted that new graduate nurses often have a high level of turnover – especially during the first year. Encouraging factors associated with organizational fit was a recommendation from this study to promote retention. Isolation and role diffusion are noted in Rural Nursing Theory as stressors to nurses working in rural areas (Long & Weinert, 2013). Having a level of education that allows the nurse to "float" among various job duties may be a positive factor if the nurse feels confident and years on the job may contribute to that sense of confidence. Job Embeddedness Theory includes organizational and community dimensions that provide a wide lens to view components that may influence a person's desires to stay or go in their current position however, there may be additional factors in the rural population that influence JE score not reflected in the JE Scale (Mitchell et al., 2001).

Aim 5

Aim 5. What factors predict job embeddedness scores for nurses working in NC-SCA?

Assumption 5. Highly embedded nurses working in rural areas will have strong ties to the community or will have had rural educational experiences.

Overall, several demographic factors were statistically significant to predict JE scores in the total NC-SCA population of nurses working in Appalachian worksites. Intent to stay, history of living in a rural area, work drive time, and distance to work from home had p values less than .05 on the multiple linear regression calculation (Cronk, 2012). Drive time mean for NC-SCA nurses was around 21 minutes. An extended drive time to work may be construed as an indicator of embeddedness in that if a nurse is willing to drive a great distance, the job has enough value to influence intent to stay. Drive time may also be considered a component of organizational fit in that a short drive time would be a perk that may influence job embeddedness. Reitz et al. (2010), noted age to be predictive of nurse retention – the older the nurse, the more likely they are to stay in their job, but that phenomenon was not statistically significant in this author's study population. In a study of nursing students, those with a prior exposure to rural settings were more apt to choose rural employment – a large percentage of participants had a history of receiving all or part of their education in a rural setting (Bushy & Leipert, 2005).

The multiple regression calculations for the highly embedded nurses working in rural areas was not predictive of JE score. However, 95.5% of the highly embedded nurses had a history of living in a rural area and 77% had a history of receiving education in a rural area and thus the assumption was supported. The format of "rural education" was not clearly outlined in the research assumption, however, and in future studies this should be clarified. Was the education received online while sitting in your home in a rural area? Or was the education received face to face in a rural setting. Does the format matter? All of these questions should be included in future studies.

Identifying and addressing factors influencing *Job Embeddedness Scale* scores appears as a recommendation in several studies. Reitz et al. (2010), recommend using the JE Scale as a part of a nurse retention effort. Halfer (2011) also encourages use of information obtained by administering the *Job Embeddedness Scale* to employees to tailor retention efforts. The Job Embeddedness Theory dimensions of "fit", "links" and "sacrifice" work together to produce an inverse relationship between job embeddedness and turnover. Noting the individual dimension scores provides valuable insight into the employees of the organization and also aids in creating a workplace that encourages retention (Mitchell et al., 2001).

Limitations

The use of self-report data from surveys is frequently cited as a limitation of research studies. Self-report relies on the truthfulness of the participant. The use of an online survey also has limitations. Spam filters kicked back several hundred invitations and many email addresses were not correct which resulted in potential participants not receiving the study invitation. Convenience sampling also poses a limitation to this study. In order to include the largest number of participants, the study population was not randomized. Also, those responding to the study may be more "tech-savvy" that the average NC-SCA nurse and may be construed as bias (Polit & Beck, 2012). The fact that a majority of the study participants were from metropolitan areas may also be considered a bias toward a more urban point of view. Not including a "prefer not to answer" or "I don't know" may have reduced the number of unanswered questions. Not specifying the format of "rural education" leaves unanswered questions of whether the education was received online from a source possibly thousands of miles away but received in a rural area or delivered face to face in a rural location. Small sample sizes in some subgroups limits generalizability of findings. Low Cronbach's alpha scores for half of the *Job Embeddedness*

Scale dimensions colors the results of the individual dimension findings, although the Cronbach's alpha score as a whole for this use of the scale as well as the original study are acceptable (Cronk, 2012; Mitchell et al., 2001). Both sets of scores denote lower values for "Community" related dimensions. The concept of "community" in the original JE scale represents geographical community but does not specify if the community is by name, county, city, etc. (Zhang, Fried, Griffith, 2012). However, in the original study, the *Job Embeddedness Scale* was noted to be a causal indicator model and a "totality of forces, many of which may be independent" and that a strong correlation among the dimensions was not necessarily expected (Mitchell et al., 2001, p. 1116).

Implications for the Nurse

Looking at the items in the sub-dimensions provides the nurse with factors to consider when looking for employment. What is important to one nurse may not be the same as what is important to another. Examining the dimensions of JE allows the nurse to look at the job opportunity from multiple viewpoints. For example, *Job Embeddedness Scale* score results and multiple regression calculations for nurses in the RUCA zip code categories 4-10.6 (all rural) indicated education level, years on the job, work drive time, feeling respected in the community, and enjoying their level of work responsibilities contributed to the *Job Embeddedness Scale* score. *Job Embeddedness Scale* score results and multiple regression calculation results for highly embedded nurses in the total study population (RUCA zip code categories 1-10.6) indicated education level, job perks, and feeling respected in the community contributed to the JE scale score. Metropolitan (RUCA zip code category 1-10.6) nurse JE scale score results indicate that having good benefits was important. For nurses with low levels of embeddedness,

areas that decrease JE scale scores include not feeling like they were a good match for the job and not feeling as if leaving their community was a sacrifice.

Keeping geographic differences in mind is important, however, location alone was not a significant predictor of turnover in rural or urban nurses in a study by Baernholdt and Mark (2013). Instead, characteristics such as "work complexity" and "support services" influenced turnover (Baernholdt & Mark, 2013, p. 6). Another study of nurses working in rural areas rated satisfactory personal time outside of work and work hours as highly related to job satisfaction and the least satisfied nurses were employed only one to three years. New nurses may benefit from employers who offer residencies or mentoring and may want to include these criteria when choosing their first nursing position (Molinari & Monserud, 2008). Asking about perks and benefits should not be skipped when interviewing for a new position as these aspects of work were important to nurse in this study population. Spending time at the potential workplace may give clues if one will "fit in" – asking if one could talk to potential co-workers may also improve the decision making process when searching for work. Taking into consideration life on the job and off the job is essential when choosing a workplace that will allow a fulfilling work-life balance. Feeling respected in the community was a recurring theme in the JE scale score findings. Working in a position you can be proud of may influence community respect if one possesses self-respect.

Implications for the Employer

Examining results from administering the JE scale allows the employer to "take the temperature" of the organization. Understanding that embeddedness includes organizational and community dimensions provides context in which to view the results critically. Just one item that the employee marks as "strongly agree" may be the very thing that keeps them in the

position – regardless of the final JE scale score. If a community based factor such as having an elderly parent nearby is the major reason an employee stays, providing a flexible schedule may improve embeddedness on the organizational side. Knowing that good benefits or perks may influence embeddedness aids in program planning. Emphasizing positive attributes of rural living such as recreation opportunities, opportunities for community relationships, and nice weather was suggested as methods to improve recruitment and retention in these areas (Molinari et al.,2011). Comparing and contrasting JE scale score results by the various RUCA zip code category codes reveals themes that influence embeddedness on the single organization level. The two highest JE scale score z-score mean sub-dimensions from nurses from the whole study population as well as the highly embedded nurses from this category leaned toward the organizational side of JE. Nurses working in rural areas as a group noted having family and roots in the community were important.

Highly embedded nurses working in rural areas noted responsibility levels and community respect as evidenced by the high z-scores of the items. Nurses with high levels of embeddedness working in metropolitan areas may be influenced by job perks and having opportunities to reach professional goals. Realizing professional growth opportunities play a role in retention may be a recruitment tool to attract nurses to hospitals who have or aim to have Magnet status (Murray et al., 2011). Professional growth opportunities were cited as positive factors leading to job satisfaction and dissatisfaction with peers were negative factors in a study of rural, northwestern nurses (Molinari & Monserud, 2009). Participating in a nurse residency program improved job satisfaction of new nurses working in rural areas over those working in urban areas. The authors posit that the nurses working in rural areas may have appreciated the social support aspects of the residency program and this in turn improved resiliency (Bratt et al.,

2012). This experience also provides an opportunity to familiarize oneself with the culture if the nurse is not from a rural area (Molinari & Monserud, 2009).

Although age is not a criterion that employers are to consider while making hiring decisions, attending to the needs of employees based on their age may improve retention. Younger workers may value child friendly schedules while the older employee may value assignments that are allow them to tutor or train younger or newer nurses (Cordeniz, 2002). The nurses in the low JE scale score group were younger than the total study population as a whole. Allowing nurses to tailor work schedules around family obligations may improve retention in nurses working in rural areas (Manahan & Lavoie, 2008).

For NC-SCA nurses, the knowledge gained from this study can inform employers that intent to stay, history of living in a rural area, work drive time, and distance to work may influence Job Embeddedness. When looking at the separate JE dimension scores for the total population of nurses working in NC-SCA, sacrifice-organization and links-organization were the two highest scoring subscale dimensions. Attending to these issues by encouraging activities that improve links along with professional and financial benefits within the organization may improve retention (Mitchell et al., 2001).

Implications for the Community

As the *Job Embeddedness Scale* and Theory includes community aspects, attending to the findings should include discussions with community leaders. Feeling respected in the community was a common positive response influencing JE scale score. Planning events that show appreciation for nurses would be an option to foster community respect. For the nurses working in metropolitan areas, a feeling that their neighborhood was unsafe contributed to a low JE scale score. Assisting nurses to find housing in safe neighborhoods may improve JE scale

scores and in turn, retention. Home ownership also was a recurring response with a positive influence on JE scale scores in the rural groups. Realtors may partner with employers to help nurses purchase homes near work (Mitchell et al., 2001; Reitz et al., 2010). Appalachian culture overlays the whole population, regardless of RUCA zip code category. Having family close is a hallmark of the area (Meyer, Toborg, Denham, & Mande, 2008) and can provide support and stability for the nurse. Nurses work odd hours and family could be a common source of child care, for example. This is a plus for working near home and kin and this aspect can support efforts to locate nursing jobs in the community.

Theoretical Implications

Rural Theory contains three relational statements. The first is that health is summarized as the ability to work and be productive. The second is the trait of self-reliance/self-sufficiency and the third is a lack of anonymity and a greater amount of role diffusion. Highly embedded nurses working in rural areas noted the ability to reach professional goals, participating on work teams, not wanting to leave their community, having friends near, fitting in with company culture, and having an acceptable level of responsibility were influences on JE scale score. Several of these factors reflect the Rural Theory relational statements in some way. Reaching professional goals may improve a sense of self sufficiency and may also include extra education that aids in competence needed to feel equipped to manage the stress of role diffusion. Participation on work teams may decrease anonymity but may also aid in "fitting in" and managing role diffusion responsibilities and improve satisfaction with work responsibilities. Having friends near would also decrease anonymity but may also lead to not wanting to leave the community (Lee & McDonough, 2013; Mitchell et al., 2001).

Job Embeddedness Theory posits that any combination of community and organizational fit, links, and sacrifice can create opportunities that can increase or decreased "embeddedness" or staying in one's position. Fit involves "fitting in" the community or workplace. Links describe the contact or attachments one has with the community or workplace. Sacrifice addresses the cost (financially and personally) attached to leaving the community or workplace. For example, highly embedded nurses from the total study population cited sacrifice on both the organizational and community sides as factors that influence JE. Feeling respected in the community would reflect fit. Participating on work teams and having family near represents links. Fit, links, and sacrifice all appeared in the lists of top JE scale score means for each population studies, and the sub-dimensions provide a richer description of the individual groups (Mitchell et al., 2001).

Job Embeddedness Theory includes community related dimensions as factors that influence whether a person stays or goes from their place of employment. When studying a population that includes nurses working in rural areas, including Rural Theory adds to the community focus. Taking this extra theoretical step reflects an appreciation of rural culture and values. As noted in Figure 2, the Rural Theory components of role diffusion, isolation, and being an insider can influence the Job Embeddedness dimensions of organizational or community fit and links. These dimensions go on to influence the final JE scale score (Mitchell et al., 2001). The use of both theories enriched the study of this population.

Policy Implications

Policy implications include organizational policy as well as health care policy. Although salary was not in the top sub-dimensions of JE for this study population, good benefits, retirement benefits, and being a homeowner were. These all require salaries adequate to support mortgage payments and facility funding adequate to provide attractive benefits packages (Reitz

et al., 2010). In this time where health care reform is a hot topic, remembering the role nursing plays in health care quality and costs could improve reimbursement for nursing care. Care coordination and primary prevention are areas where nurses can make a cost saving difference (American Nurses Association, 2016). Recognition of the role of nurses could also improve the feeling that one is respected in the community – another top JE sub-dimension (Mitchell et al., 2001).

Having opportunities for professional growth was also a top JE sub-dimension. Organizations can offer in-house educational opportunities or support outside nursing education opportunities such as conference attendance. This support also may improve confidence for rural nurses performing in a generalist role (Long & Weiner, 2013; Mitchell, et al., 2001).

Nursing Education Implications

Nursing education – both as a student and an educator – has retention, turnover, and Job Embeddedness ramifications. Receiving education in a rural area has been noted to improve nurse retention in rural areas (Daniels et al., 2007). In the past, this education may have been received in the form of face to face classes in an attempt to "grow your own" health care providers (Rural Health Information Hub, 2017). Now, online or distance education has the potential to broaden the academic opportunities for nurses working in all areas. One is not limited to the offerings of local schools and universities. The impact of these new opportunities has not been fully assessed and will require future research regarding nurse retention.

Nurse educators teaching online or distance classes face the challenge of producing satisfactory educational environments that supports nurses working in a variety of settings. Studying the aspects of the *Job Embeddedness Scale* that reflects education may be a useful path for curriculum development. For example, several JE sub-dimensions are related to working

with others. Encouraging group work and inter-professional education would equip nurses to participate on committees and teams which in turn may augment embeddedness (Mitchell et al., 2013).

Continuing education supports the new graduate as well as the seasoned nurse in all geographic settings and may improve nurse retention (Dowdle-Simmons, 2012). As stated earlier, opportunities for professional growth was a top sub-dimension. The encouragement of life-long learning is another JE dimension that could be emphasized by nurse educators as a means to improve retention in nurses (Mitchell et al., 2001).

Suggestions for Further Research

Future research suggestions include:

- Repeating this study periodically would greatly add to the literature regarding NC-SCA nurses – especially those nurses working in rural areas.
- Repeating this study internally in individual organizations may provide a rich source of information to improve retention and reduce turnover.
- Analyzing data by separate levels of education.
- A qualitative study using the six JE scale dimensions as conversation starters would provide further insight into the particular study population – especially the nurses working in rural areas.
- It was beyond the scope of this study to do an in-depth qualitative data analysis of the "Additional Comments" section of this questionnaire, although individual comments were used to support the statistical calculations when applicable. Completing this analysis would provide additional information to support findings from this study.

Conclusion

The use of the *Job Embeddedness Scale* along with a demographic questionnaire proved to be a rich source of information and added to nursing knowledge regarding nurses working in NC-SCA. The study purpose was met in that study findings provide guidance to employers as to what factors predict JE, turnover, and retention in this population. As stated earlier, improvement in retention stands to improve the health outcomes of the area residents (American Association of Colleges of Nursing, 2014). Also, knowledge of factors that influence JE may inform the nurse recruitment efforts of area employers.

Finally, the study of JE of nurses working in NC-SCA provided several useful findings. Research in this area is limited at best, so establishing a "baseline" may prove useful to employers. Learning that the JE score of nurses working in metropolitan areas was higher than those working in rural areas is also an observation that may be of use to employers. Understanding components of rural theory such as the influence of being an "insider" aids the employer in creating environments that plays up this phenomenon to improve retention of nurses working in rural areas (Long & Weinert, 2013). Noting that the turnover intention is a bit higher for this study population than the southeastern United States as a whole is cause for concern (NSI, 2017). Employers may have to exert more attention to the significant characteristics mentioned in this study – particularly education level, tenure, intent to stay, history of living in a rural area, work drive time, and distance to work. Finally, the JE Scale appears to be useful in predicting intent to leave and intent to stay in the study population as a whole. This provides a measure of confidence to employers that investing in the study of JE in this population as a whole may provide valuable information regarding the JE with regards to turnover and retention

(Mitchell et al. 2001). Additional JE research in large rural, small rural, and isolated areas may identify influences that could be included when using the JE scale in this population.

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APPENDICES

Appendix A

Invitation with reminder

Email subject heading:

Research study invitation: Job Embeddedness of Nurses Working in South Central Appalachia's North Carolina Counties

Greetings!

You recently received an invitation to consider participation in my study "Job Embeddedness of Nurses Working in South Central Appalachia's North Carolina Counties". If you did wish to participate and did not submit a survey, you have the opportunity to do so now. If you have already submitted a survey, please disregard this reminder and thank you for your response! If you do not wish to participate, I thank you for your time and you may disregard this request.

Sincerely,

Susan Adams, PhD(c), FNP-BC

Study title: JOB EMBEDDEDNESS OF SCA-NC NURSES

To whom it may concern:

My name is Susan Adams and I am a student at East Tennessee State University. I am working on a PhD in Nursing. In order to finish my studies, I need to complete a research project. The name of my research study is "Job Embeddedness of Nurses Working in South Central Appalachia's North Carolina Counties". The purpose of this study is to study the level of "job embeddedness" (or how likely you are to stay in your current job) of nurses working in the South Central Appalachian counties of North Carolina. I would like to give a brief online survey to nurses using Checkbox. It should only take about 10-20 minutes to finish. You will be asked questions about yourself, your work, and your community. No physical or emotional harm is expected from participation in this study. This study may benefit you or others by gaining knowledge about what keeps nurses working in this area.

Your confidentiality will be protected as best we can. Since we are using online technology no guarantees can be made about the interception of data sent over the Internet by any third parties, just like with emails. We will make every effort to make sure that your name is not linked with your answers. Checkbox has security features that will be used: IP addresses will not be collected and SSL encryption software will be used. Although your rights and privacy will be protected, the East Tennessee State University (ETSU)/Veterans Administration (VA) Institutional Review Board (IRB) (for medical research) can view the study records.

Taking part in this study is voluntary. You may decide not to take part in this study. You may quit at any time. You may skip any questions you do not want to answer or you can exit the online survey form if you

want to stop completely. If you quit or decide not to take part, you are free to do so without penalty.

If you have any research-related questions or problems, you may contact me, Susan Adams, at [redacted]. I am working on this project together with my teacher, Dr. Florence Weierbach. You may reach her at [redacted] Also, you may call the chairperson of the IRB at ETSU at [redacted] if you have questions about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone who is not with the research team or if you cannot reach the research team, you may call an IRB Coordinator at [redacted]

If you would like to participate, please read the information below. If you do not care to participate do not click any boxes and I thank you for your time.

Sincerely,

Susan Adams, PhD(c), FNP-BC

To participate please continue:

Clicking the AGREE button below indicates

- I have read the above information
- I agree to volunteer
- I am at least 18 years old

☐I AGREE (checking this box will open the survey)

☐I DO NOT AGREE (Thank you - you may exit from this email now)

Ver. 2/09/2017

Susan Adams, PhD(c), FNP-BC

[redacted]

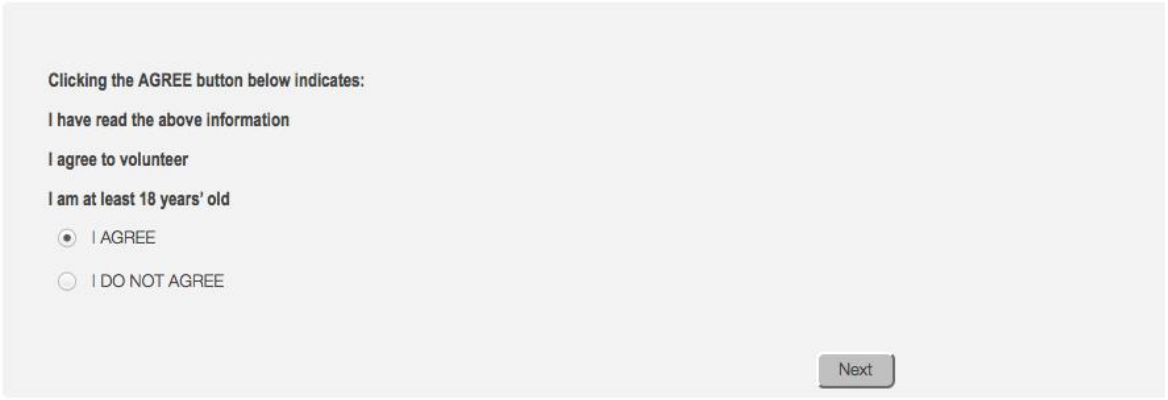
Approved†by†ETSUØVA†Medical†IRB†Ø†Approval†Date∫†02Ø16Ø2017†Ø†Expiration†Date∫

[redacted]

Approved†by†ETSUØVA†Medical†IRB†Ø†Approval†Date∫†02Ø16Ø2017†Ø†Expiration†Date∫

Appendix B

Checkbox Survey Agree Button



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